Welcome Message

Dear Colleagues/Friends,

I would like to welcome you to the 7th annual Global Humanitarian Technology Conference hosted by IEEE Region 6 and the Santa Clara Valley section. Our goal for this year’s program is to focus on input from practitioners working in the field fulfilling humanitarian needs as well as those doing more academic research with humanitarian technology applications.

I believe you will find interesting reports, investigations, and research reported in all our technology tracks: Health, Energy, Communications, Education, Water, Sanitation, Agriculture, and Disaster Management. We will also explore the many Humanitarian Challenges and Opportunities that exist today.

We will open Friday with a keynote from Dr. Larry Alder, VP of Product Definition, OneWeb. Saturday will begin with a keynote from Dr. Darelle Van Greunen, Nelson Mandella University. And we will close Sunday with a keynote from Maurizio Vecchione, Executive Vice President of Global Good & Research.

In keeping with our goal of providing more practitioner input from the field, we will hold several topical panels. On Friday, there will be a panel on Energy moderated by past conference chair, Joe Decuir. On Saturday, there will be a panel on Healthcare moderated by our current technical program chair, Paul Cunningham. And on Sunday there will be three targeted panels on Economic Development of Rural Women in Rwanda, a review of the Peugeot Center's Completed Projects, and a panel on Distributed Manufacturing for Humanitarian Response.

There are two pre-conference tutorials planned for Thursday that will be of significant interest. The first, Internet-of-Things (IoT)-Enabled Water Quality Testing and Analysis. And the second, High-Quality, Low-Cost Education with the Raspberry Pi. Please sign up to attend one or both of these interesting sessions.

There will be plenty of opportunities to socialize and network with all the attendees. In addition to lunches and breaks, there will be a welcome reception on Thursday evening sponsored by the IEEE Young Professionals and Women in Engineering. Friday evening, there will be a reception sponsored by the IEEE Special Interest Group on Humanitarian Technology (SIGHT). And finally, on Saturday evening we will hold a banquet dinner and Region 6 awards ceremony. Please RSVP for this dinner when you register for the conference.

I am very proud to say that our conference has grown in stature such that it attracts many of the leaders in the field of humanitarian technology. Due to so many of the right people being in one place at the same time, several groups will be holding associated meetings and workshops before and during the GHTC event. The IEEE Humanitarian Activities Committee (HAC) will be holding a workshop. IEEE Smart Village, in conjunction with the United Nations, will be holding an interactive workshop and strategic pre-conference forum on Thursday. The IEEE Special Interest Group on Humanitarian Technology (SIGHT) will be holding their own workshop during the conference. IEEE MGA Region 6 will use the gathering as an opportunity to hold Area meetings during the conference.

The conference committee would like to thank all of our sponsors, patrons, and exhibitors. Of course, we would not have a conference without all the speakers, authors and you, the participants in GHTC-2017. Thank you and I look forward to seeing you again, next year, at GHTC-2018 at the same venue.

Richard S. Wilkins
General Chair – GHTC-2017
Assoc. Professor, Thomas College, Waterville Maine
IEEE 2017 Global Humanitarian Technology Conference Organizers

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Tutorials Chair
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Conference Catalysts, LLC, United States
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Michael Andrews

Advisor, R6 Director 2015-16
Tom Coughlin

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Energy Track
Adil Usman
Priya Misha
Bai Blyden

Health Track
Charmayne Hughes
Alan Mickelson

Humanitarian Challenges & Opportunities Track
Khanjan Mehta
Satish Babu

Poverty Alleviation/ Deployment Track
Roger Johnson
Jonathan Shakes

United Nations Sustainable Goals Track
Mike Lightner

Clean Water and Sanitation
Alexander Anderson
Bob Wubbena

Connectivity and Communications
Esther Obonyo

Agriculture and Food Security
Joan Kerr

Education
Olga Anderson
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Financial Patrons

Joseph Decuir

Coffee Break Patron

Coughlin Associates

Beginner Patrons

Scott Tamashiro | Erik Godo | Robbert Wubbena
Africa Development Promise, believes that collective action and enterprise are proven pathways for empowering rural women to achieve their economic goals. With programs in Rwanda and Uganda, we begin with agriculture because it is a way of life in Eastern Africa, and over 70 percent of the rural women rely on subsistence farming for food security and employment. Africa Development Promise moves women from food for subsistence to food for business using the cooperative model of enterprise. We deliver programs that strengthen cooperative management, governance, efficiency, and sustainability, and also building strong technical skills. We also provide much-needed farm infrastructure support such as greenhouses, irrigation systems, and tools that relieve drudgery, improve efficiency, and productivity. Through the cooperatives, women not only build their business know-how and technical capacity, but they also earn a sustainable income and build their savings through cooperative savings and loans associations.

The Frugal Innovation Hub's (FIH) mission is to engage students and faculty in technological and humanitarian projects through partnerships and programs. The FIH acts as a liaison between engineering students, faculty members, and organizations (our clients) to solve together humanitarian problems. We also act as a facilitator between the students and their clients to ensure the consolidating of projects and the appropriate technology for the deliverables.

Today, two billion people around the world do not have access to banking. Humaniq aims to increase financial inclusion worldwide by providing new financial services to the unbanked based on blockchain technology and biometric identification systems. With this new mobile digital economy, we will help people who are excluded from the financial system break free from poverty and improve their lives, and emerging economies shift into the cryptoeconomy.
Access to electricity creates opportunity and improves lives in remote communities around the world. The IEEE Smart Village global network brings together local entrepreneurs, experienced engineers, expert educators, and passionate volunteers to seed-fund, launch, sustain, and develop clean energy and advanced education systems that serve their community’s needs. Light bulbs are just the beginning, because we’re about more than just power. We engage with our partners to foster the long-term mentorship, support, and continual shared learning that helps these community start-ups thrive. By working locally and connecting globally, the collective IEEE Smart Village family strives to make a lasting impact in villages across Cameroon, Haiti, India, Kenya, Nigeria, South Sudan, and Zambia. We bring the basic electrical services and transformational educational opportunities that support community well-being – from schools to clinics to businesses – to more than 50 million people by 2025. Together, we’re lighting up homes, businesses, and global classrooms – and empowering local economies.

The IEEE Empower A Billion Lives competition is a $1 million global challenge to create energy access solutions that can scale to one billion people living in extreme energy poverty. The goal of the IEEE Empower a Billion Lives competition is to enable the creation of holistic and financially sustainable solutions for energy access that can rapidly scale to one billion people living in energy poverty.

The competition is agnostic to energy sources, technologies, business models, and will primarily evaluate potential impact and ability to rapidly and sustainably scale the solutions to one billion customers. [www.empowerabillionlives.org](http://www.empowerabillionlives.org)

Exhibits will be in the Donner Room Hallway.

The exhibit area will be open from 13:00 – 18:00 Friday, October 20th and open at 10:00 AM Saturday October 21st and closing 6:00 PM.
Tutorial

Thursday, October 19, 2017 | 13:30 – 17:30 PM
Room: San Jose

**Internet-of-Things (IoT)- enabled Water Quality Testing Analysis**

**Instructor:** Tokunbo Ogunfunmi, Santa Clara University, USA
Shivakaumar Mathapathi. Santa Clara University, USA

**Abstract:** The U.N. estimates that by 2025, forty-eight nations, with combined populations of 2.8 billion, will face freshwater scarcity. Fifty percent of worldwide groundwater is unsuitable for drinking because of pollution and only about .007% of the water on earth is accessible for human use.

Every 20 seconds, a child dies from a water-related disease. Children in polluted environments often carry about 1,000 parasitic worms in their bodies at any time. The recent reports indicate that the diseases due to the consumption of contaminated water are increasing and causing more than 3.4 million deaths each year among human beings worldwide, also the increasing water pollution is becoming a big threat to water habitat.

The proposed tutorial provides two parts of the program. The first part covers the basic principles of Internet of Things (IoT), design, infrastructure, connectivity and the core concepts of IoT such as sensing, processing and reporting the data to the cloud. The second part describes the implementation, prototype and few use cases.

The attendees will learn various types of IoT hardware such as Intel and ARM mBed family, Sensor connectivity protocols including UART, GPIO and I2C. The instructor will also cover topics on Cloud platform and Analytics. In this workshop, the Cloud technologies explained are AWS IoT, IBM Bluemix, Microsoft Azure and GE Predix. At the end, the audience will have an opportunity to witness few demonstrations on analytics.
Keynote Speaker

Friday October 20, 2017 | 08:00 - 09:30
Room: Sierra/Cascade/Siskiyou

Dr. Larry Alder

Vice President of Product Definition, OneWeb

Bio: Dr. Larry Alder currently is the VP of Product Definition at OneWeb developing low latency satellite based broadband globally. He is also currently Co-Chair of NTIA’s Commerce Spectrum Management Advisory Committee and has been a member of the committee since 2011. Alder was previously at Google as Director of Access Strategy from 2005-2016 where was responsible for a number of product, policy, and strategic investment activities promoting Internet access. Alder led Google’s Project Link to bring a shared fiber infrastructure network to multiple countries Africa. He also was leader in Google’s project to bring Wi-Fi to the India rail stations. Alder also served on the board of O3b Networks, a global satellite service provider. Prior to joining Google, Alder spent 10 years at ArrayComm, where he served as vice president of technology development. He has a Ph.D. in Engineering from Stanford University in the specialty of Control Theory and Bachelor’s degree in Engineering from UCLA.
Keynote Speaker
Saturday October 21, 2017 | 08:00 - 09:30
Room: Sierra/Cascade/Siskiyou

Darelle Van Greunen
Nelson Mandela University, South Africa

Bio: Darelle Van Greunen is a Professor in the School of ICT and the Director of the Center for Community Technologies at the Nelson Mandela University in Port Elizabeth, South Africa. The social activist and award-winning researcher has a multidisciplinary background, combining computer science, information systems, African languages, education, media studies and psychology. She holds a number of degrees with her PhD being in Computer Science. Her research focuses on using technology as an enabler in society but with a strong focus on how humans interact with technology. Her research is combined with real-life interventions in different communities of Africa. She is best known for her passion to transform low-income communities through the use of technology as an enabler and catalyst to respond to social issues.
Maurizio Vecchione

Executive Vice President of Global Good & Research

Bio: Maurizio Vecchione is the Executive vice president for Global Good and Research at Intellectual Ventures in charge of the Global Good Fund. In this role, he oversees IV’s collaboration with Bill Gates to invent and deploy technology specifically focused on improving life in developing countries, as well as the Intellectual Ventures Laboratory and Institute for Disease Modeling. The Global Good Fund is the world’s largest investor in inventions for the benefit of the poorest three billion people on the planet, focusing on disruptive innovation in global health and global development for the benefit of humanity. Funded by the Bill and Melinda Gates Asset Trust and operating in coordination with the Bill and Melinda Gates Foundation, Global Good utilizes philanthropic funds to incubate and develop market driven companies that can produce catalytic humanitarian impacts while using market forces to scale up globally and across the 75 poorest nations on Earth. Global Good operates its own multidisciplinary research laboratory with relationships with over 4,000 research institutions globally, and the Institute for Disease Modeling to facilitate discovery and translational science in support of its investments. Major area of investment focus are diagnostic and clinical technology aimed at the top 10 global burden diseases, primary care health strengthening innovation, maternal and child health innovations, nutrition technologies, prevention including vaccines as well as agriculture and agricultural productivity technologies. With more than 30 years of experience in the technology and life sciences sector, Mr. Vecchione has helped build nine start-ups and launched more than 50 commercial products spanning life-sciences, health technologies, therapeutics and as well as telecommunications, information and material sciences. He most recently served as CEO of Arrogene, which is commercializing a new nanotechnology platform for cancer therapeutics and diagnostics, and as CEO of telemedicine pioneer CompuMed. As an inventor himself, Mr. Vecchione is named on multiple U.S. patents and patent applications related to imaging, image processing, nano-bio-polymer and telecommunications technologies.
Meet the Panelists

**Alexander Anderson**

Alexander Anderson is Chair of IEEE Smart Village Partner Engagement and co-founder of Odin Energy Works LLC, an R&D firm providing innovative technology and education solutions. With a background in both mechanical and power systems engineering, Anderson’s doctorate research focuses on advanced energy management of rural microgrids from a systems engineering standpoint with applications in Africa and the South Pacific. He has won multiple grants and awards for his research from Boeing, American Institute of Aeronautics and Astronautics, US energy utilities, and the American Public Power Association. His interests include integration of renewables, microgrid electrification, power system modeling, humanitarian engineering, and sustainable community development.

**Joseph Decuir, FIEEE (moderator)**

Joseph Decuir has lead several IEEE Global Humanitarian Technology Conferences (vice-chair 2014, chair 2015 and 2016). One focus of those conferences is electric power for the developing world. Joseph has contributed to dozens of widely used public engineering standards, including ITU-T V-series modems, Universal Serial Bus (USB) and Bluetooth. He now works in the electrical engineering faculty at the University of Washington. Joseph serves on the IEEE Consumer Electronics Society Board of Governors, and as Secretary for IEEE Region 6.

**Henry Louie, PhD**

Dr. Henry Louie is an expert on off-grid energy development in less economically developed communities. He has worked on electrification projects in Kenya and Zambia. His research includes sustainability, data analysis and renewable energy modeling.

Dr. Louie is an Associate Professor of Electrical and Computer Engineering at Seattle University. He is also a co-founder of Kilowatts for Humanity, www.kilowattsforhumanity.org.
Peter Michael, PE, PhD candidate

Peter Michael is a professional Electrical Engineer working on large-scale system integration projects. In addition to P.E. licenses, Peter holds ASIS Physical Security Professional and PMI Project Management Professional certifications. Peter, IEEE member, has a BSEE, a Master in Systems Engineering, and is currently working on a PhD in Electrical Engineering at the University of South Florida.

Sarah Majok

Sarah Aggrey Majok is Founder and CEO of Sarah Aggrey Consulting Engineers, a small technical advisory firm focused on transmission planning, renewable project support, and regulatory support. She has 20 years of experience in the energy industry covering transmission planning, renewable generation integration, and solar project due diligence. Sarah has conducted numerous technical studies and assessments for large electric utilities and solar project developers in seven countries. Before launching her consulting firm, Sarah spent 18 years as a renewables engineering manager at Black & Veatch, a principal transmission planning engineer at SMUD and a senior consultant at Navigant Consulting. Sarah holds a Bachelor of Science and a Master of Science degree in Electrical and Electronic Engineering from California State University, Sacramento.

Bruce Nordman

Bruce Nordman is a Research Scientist at Lawrence Berkeley National Laboratory in Berkeley, California. His work focuses on technology at the intersection of energy use and efficiency, electronics, and networks. He works on technology standards from physical layer protocols to application layer protocols to user interfaces, as well as the overall architecture of power distribution and IT systems in buildings.
### IEEE Global Humanitarian Technology Conference 2017

**PROGRAM AT A GLANCE**

<table>
<thead>
<tr>
<th>Time</th>
<th>October 19, 2017</th>
<th>October 20, 2017</th>
<th>October 21, 2017</th>
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<tr>
<td>7:00am</td>
<td>Registration Open - Bayshore Foyer;</td>
<td>Registration Open - Bayshore Foyer; Breakfast - Sierra/Cascade/Siskiyou</td>
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<td>9:00am</td>
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<td>Conference Welcome – Dr. Wilkins (GHTC 2017 Chair)</td>
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<td><strong>Panel Session: Energy - Sierra/Cascade/Siskiyou</strong></td>
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<td>Moderator: Joe Decuir; Panelists: Alexander Anderson, Joe Decuir, Peter Michael,</td>
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<td><strong>Panel Session: Healthcare - Sierra/Cascade/Siskiyou</strong></td>
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<td>9:00am</td>
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<td>1:00pm</td>
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### Additional Information

- **Registration Open**: Bayshore Foyer; Breakfast - Sierra/Cascade/Siskiyou
- **Breakfast - Sierra/Cascade/Siskiyou**: San Jose, Santa Clara, Carmel, Monterey, San Carlos
- **Keynote**: Sierra/Cascade/Siskiyou - Dr. Darelle Van Gruenen, Nelson Mandela University
- **Panel Session: Energy - Sierra/Cascade/Siskiyou**: Moderator: Joe Decuir; Panelists: Alexander Anderson, Joe Decuir, Peter Michael, Sarah Majok, Henry Louie & Bruce Nordman
- **Panel Session: Healthcare - Sierra/Cascade/Siskiyou**: Moderator: Paul Cunningham
- **Lunch - Sierra/Cascade/Siskiyou**: San Jose, Santa Clara, Carmel, Monterey, San Carlos
- **Break - Poolside Foyer**: There will be a Hall Allocation
- **Break - Poolside Foyer**: There will be a Hall Allocation

**Conference Reflection Session w/ Track Chairs**

- **Closing Remarks - Sierra/Cascade/Siskiyou**: Keynote - Maurizio Vecchione, Global Good and Research
- **Conference Reflection Session w/ Track Chairs**: Global Good and Research
**Thursday, October 19, 2017**

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<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
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<tr>
<td>07:00 - 18:00</td>
<td><strong>Tutorial Registration</strong></td>
<td>Room: Bayshore Foyer</td>
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<tr>
<td>08:00 – 16:30</td>
<td><strong>IEEE Smart Village and United Nations Interactive Workshop</strong></td>
<td>“Empowering Off-Grid Communities through the 17 SDGs: A workshop by IEEE Smart Village in conjunction with UN”</td>
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</table>
| 13:30 – 17:30 | **Tutorial: Internet of Things (IoT)- enabled Water Quality Testing and Analysts** | Instructor: Tokunbo Ogunfunmi, Santa Clara University, USA  
Shivakaumar Mathapathi, Santa Clara University, USA  
Room: San Jose |                                                                 |
| 18:30 - 20:30 | **Young Professional and Women in Engineering Reception** | Keynote: Rebecca Masisak, CEO TechSoup  
Keynote: Jim Conner, Member of Sand Hill Angels, Executive Producer of Game Changers Silicon Valley, CEO of First Focus Learning Systems  
Room: Donner | All attendees are invited to the Welcome Reception for drinks and light hors d'oeuvres. |
### Friday, October 20, 2017

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<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Details</th>
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<tr>
<td>07:00 - 18:00</td>
<td>Registration</td>
<td>Room: Bayshore Foyer</td>
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<tr>
<td>08:00 - 08:15</td>
<td>Opening Remarks</td>
<td>Dick Willkins, 2017 General Chair Room: Sierra/Cascade/Siskiyou</td>
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<tr>
<td>08:15-09:30</td>
<td>Opening Keynote: Dr. Larry Alder</td>
<td>Room: Sierra/Cascade/Siskiyou</td>
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<td>Connectivity Challenge and Evolving Solutions</td>
<td>Dr. Larry Alder VP of Product Definition, OneWeb</td>
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<td></td>
<td><strong>Abstract:</strong> It has been well established that connectivity is vital to development and has elevated to basic need for humans on par with electricity. Connectivity is vital to emerging economies as well with every 10% increase in Internet penetration there is a resultant 1.5% growth in GDP. While there has been great progress in the area of devices with the advent of mobile devices and in particular the smartphone, connectivity remains a challenge. Many emerging economies have limited or expensive data access. In fact, at times folks have smartphones in these markets but don’t enable data plans or keep data consumption very modest. In 2016, Internet usage rates were about twice as high in developed countries as in developing countries and more than twice as high in developing countries than in least developed countries. In this talk, we will discuss some of the challenges and emerging solutions to closing this connectivity gap.</td>
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<td>06:30 - 08:30</td>
<td>SIGHT Reception</td>
<td>Keynote Speaker: Sayre White, Product Manager at AnniCannons Room: Sierra/Cascade/Siskiyou</td>
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Friday, October 20, 2017 | Technical Sessions

10:00 – 11:30
A1: Maternal Health Issues
Room: San Jose
Session Chair: Alan Mickelson

10:00
Video-based IoT Baby Monitor for SIDS Prevention
Xiaoting Liu, Santa Clara University, USA
Kyle Takeuchi, Santa Clara University, USA
Tokunbo Ogunfunmi, Santa Clara University, USA
Shivakaumar Mathapathi, Santa Clara University, USA

10:15
Development of Smart Phone-based Child Health Screening Tools for Community Health Workers
Richard Fletcher, MIT, USA
Xavier Soriano Diaz, MIT, USA
Honey Bajaj, MIT, USA
Suparna Ghosh-Jerath, PHFI, India

10:30
Tablet App for Child Cognitive Assessment in Low and Middle Income Countries
Patricia Francis-Lyon, University of San Francisco, USA
Amina Abubakar, Wellcome Trust, Kenya
Yasser Attiga, University of San Francisco, USA
Rashmi Manjunath, University of San Francisco, USA
Uma Ramasubramanian, University of San Francisco, USA
Vaishali Chaudhuri, University of San Francisco, USA
Tri Nguyen, University of San Francisco, USA
Xiangyi Xu, University of San Francisco, USA
Siyang Zeng, University of San Francisco, USA
Charles Newton, KEMRI, Wellcome Trust, Kenya

10:45
Screening Donated Breast Milk in the Developing World: Market Evaluation and Needs Identification for Rapid and Sustainable Methods of Screening Donated Milk at Human Milk Banks
Karen Mac, Santa Clara University, USA
Nina Morrison, Santa Clara University, USA
Samantha O'Connor, Santa Clara University, USA
Taylor Tromburg, Santa Clara University, USA
Callie Weber, Santa Clara University, USA
Unyoung Kim, Santa Clara University, USA
Michele Parker, Santa Clara University, USA

11:00
Exploring Female Infertility Using Predictive Analytics
Simi M S, APJ Abdul Kalam Technological University, India
Sanakranayaki K, Adishankara Institute of Engineering and Technology, Kaladi, India
Murali Parameswaran, Adishankara Institute of Engineering and Technology, Kaladi, India
Sabine Sivadasan, Sabine Hospital, India

11:15-11:30
Q&A Opportunity
<table>
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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speakers</th>
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| 10:00 – 11:30 | **A2: Micro-Grids** <br>Room: Santa Clara <br>Session Chair: Pritpal Singh | **10:00** Optimizing Rural Village Micro Grids to Provide Affordable and Reliable Renewable Electricity in Developing Countries <br>Daniel Zimmerle, *Colorado State University, USA* <br>Dale Manning, *Colorado State University, USA*  
**10:15** Socioeconomically Sustainable Rural Microgrid Engineering <br>William Harris, *Texas A&M University, USA* <br>Mehrdad Ehsani, *Texas A&M University, USA*  
**10:30** Analyzing suboptimal rural microgrids and methods for improving the system capacity and demand factors - Flibab microgrid case study examined <br>Nirupama Prakash Kumar, *Smart Wires Inc., USA* <br>Mahekdeep Singh, *Seattle University, USA* <br>Peter Dauenhauer, *University of Strathclyde, United Kingdom, Great Britain* <br>Likonge Makai, *LICH Community Solutions, USA* <br>Henrietta Cho, *Meds & Food for Kids, Haiti* <br>Joseph Mutale, *University of Manchester, United Kingdom, Great Britain*  
**10:45** Optimization of Advanced Energy Storage for Solar-Diesel Hybrid Microgrids <br>Douglas Danley, *NRECA, USA*  
**11:00** Optimization of Photovoltaic Penetration for a Hybrid Diesel and Photovoltaic Micro-Grid Via Means of a Cloud Forecasting System <br>Stacey Dufrane, *Colorado State University, USA* <br>Daniel Zimmerle, *Colorado State University, USA* <br>Gerald P Duggan, *Colorado State University, USA*  
**11:15-11:30** Q&A Opportunity |
10:30
Comparison of CNN Models for Application in Crop Health Assessment with Participatory Sensing
Prakruti Bhatt, Tata Consultancy Services, India
Sanat Sarangi, Tata Consultancy Services, India
Srinivasu Pappula, Tata Consultancy Services, India.

10:45
UAV Imaging with Low-cost Multispectral Imaging System for Precision Agriculture Applications
Jaime Luis E Honrado, Ateneo de Manila University & Skyeye, Inc., Philippines
Dominic B. Solpico, Ateneo de Manila University & Skyeye, Inc., Philippines
Chrisandro Favila, Ateneo Innovation Center, Philippines
Edgardo E Tongson, World Wide Fund for Nature - Philippines, Philippines
Gregory L Tangonan, Ateneo de Manila University, Philippines
Nathaniel Libatique, Ateneo de Manila University, Philippines

11:00 **Remote Presentation
Modelling a Smart Agriculture System for Multiple Cropping using Wireless Sensor Networks
Durga P, Amrita Center for Wireless Networks and Applications, India
Gayathri Narayanan, Amrita Vishwa Vidyapeetham-AMRITA University, India
Gayathri B, Amrita Vishwa Vidyapeetham, India
Maneesha Ramesh, Amrita University, India
Divya Pullarkatt, Amrita Vishwa Vidyapeetham, India

11:15-11:30
Q&A Opportunity

10:00 – 11:30
A4: Water
Room: Monterey
Session Chair: Bob Wubbena & Alexander Anderson

10:00
Effective and Affordable Water Purification Instrument for Chronic Kidney Disease Patients in Anuradhapura, Sri Lanka
Dinesh Cozian, IEEE Member, USA
Pubudu Kumarage, Self Employed, USA
Pavan Biigi, Caltech University, USA
Tigran Danielyan, Self Employed, USA

10:15 **Remote Presentation
Water Quality Monitoring and Waste Management using IoT
Maneesha Vinodini Ramesh, Amrita Vishwa Vidyapeetham, Amrita University, India
Renjith Mohan, Amrita Vishwa Vidyapeetham, India
Anupama Kurup, Amrita Vidyalayam, India
Nibi K V, Amrita Vishwavidyapeetham, India
Aiswarya A, Arsha A, AmritaVidyalayam, India
Sarang P R, AmritaVidyalayam, India

10:30
Demonstration of a Wave-powered Desalination System in Cape Verde
Bill Staby, Resolute Marine Energy, USA

10:45 **Remote Presentation
A Low Cost Wireless Sensor Network for Water Quality Monitoring in Natural Water Bodies
Gayathri Menon, Amrita University, Amritapuri, India
Maneesha Ramesh, Amrita University, India
Divya Pullarkatt, Amrita Vishwa Vidyapeetham, India
11:00
Off-Grid Solar Powered Water Purification and Community Development in Haiti’s Artibonite Valley, the Heart of Haiti’s Cholera Epidemic
Geoffrey Kain, Embry-Riddle Aeronautical University, USA
Rachel Hunt, Embry-Riddle Aeronautical University, USA
Joseph Noto, Embry-Riddle Aeronautical University, USA
Jonathan Prine, Embry-Riddle Aeronautical University, USA
Calli Brown, Embry-Riddle Aeronautical University, USA
Marc Compere, Embry-Riddle Aeronautical University, USA

11:15- 11:30
Q&A Opportunity

10:00 – 11:30
A5: HAC Workshop- Supporting Sustainable Development
Moderator: Paul Cunningham
Room: San Carlos
This highly participatory workshop will focus on providing an opportunity for all key stakeholders involved in or interested in getting involved in sustainable development and humanitarian technology to share insight, discuss the co-design of projects and brainstorm. Topics that will be discussed include:
• Potential Role of Collaborative Open Innovation
• Designing an Ethical Development Project
• Monitoring & Evaluation and Impact Assessment

11:30 – 12:30
Panel Session: Energy
Panelists:
Alexander Anderson, Chair of IEEE Smart Village Partner Engagement
Joseph Decuir, editor of P2030.10, former GHTC chair
Sarah Majok, power consultant in Sacramento CA, expertise includes Africa and India.
Peter Michael, chair of P2030.10 TG3
Bruce Nordman, researcher at Lawrence Berkeley Lab, contributed separate paper to GHTC17
Room: Sierra/Cascade/Siskiyou
Moderator: Joe Decuir

Topics of Discussion:
• Focus on practical everyday uses
• Keep our customers in mind
• Consider eventual microgrid interconnection
• How would we use communications between power sources and loads?
• Why develop a standard?
• What is our roadmap?
• Ideas from the audience
• Collect interested people

12:30 – 13:30
Lunch
Room: Sierra/Cascade/Siskiyou

13:30 – 15:00
B1: Physicals and Neurological Health Issues
Room: San Jose
Session Chair: Alan Mickelson

13:30
Design of a cellular-enabled data-logging system for wheelchair use characterization
Amit Gandhi, Massachusetts Institute of Technology, USA
Prithviraj Sundararaman, Massachusetts Institute of Technology, USA
Matt McCambridge, Massachusetts Institute of Technology, USA
Julia Heyman, Massachusetts Institute of Technology, USA
Daniel Frey, Massachusetts Institute of Technology, USA
13:45
**Pseudo Fatigue Test of Passive Energy-Returning Prosthetic Foot**
Gabriel I Lopez-Avina, Tecnologico de Monterrey & Biomechatronics Laboratory, Mexico
Eduardo Barocio, Purdue University & School of Materials Engineering, Mexico
Joel Huegel, Tecnologico de Monterrey & Biomechatronics Lab, Mexico

14:00
**Design, Development and Implementation of a Biomechanical Right-Hand Prosthesis: Second Stage**
Luis Fernando Cajamara, Universidad Politecnica Salesiana, Ecuador
Jorge Matute, Universidad Politecnica Salesiana, Ecuador
John Calle, Universidad Politecnica Salesiana, Ecuador
Fernando Yunga, Universidad Politecnica Salesiana, Ecuador
Jose Vargas, Universidad Politécnica Salesiana, Ecuador
Fernando Urgiles, Universidad Politecnica Salesiana, Ecuador

14:15
**Giving blind a smart eye: Designing and modeling of intelligent white cane for blind people**
Muhammad Hanan, Mehran University of Engineering & Technology, Jamshoro, Pakistan
Anwar Ali Sahito, Mehran University of Engineering & Technology Jamshoro Pakistan, Pakistan
Amir Mahmood Soomro, Mehran University of Engineering & Technology, Jamshoro, Pakistan
Faheem Shafeequ Channar, Mehran University of Engineering & Technology, Pakistan

14:30- 15:00
Q&A Opportunity

13:30 – 15:00
**B2: Solar Energy**
*Room: Santa Clara*
*Session Chair: Adil Usman*

13:30
**Using Power Management Control to Maximize Energy Utilization and Reliability within an Interconnected Network of Solar Home Systems**
Bartosz Soltowski, University of Strathclyde, United Kingdom, Great Britain

13:45
**Business operations for a solar energy kiosk in Chalokwa, Zambia**
Matt Shields, Seattle University, USA
Lisa Zhao, Seattle University, USA
Matt Salmon, KiloWatts for Humanity, USA
Lucy Pieterse, Green Trust, Zambia

14:00
**The Design, Installation and Testing of a Prototype Photovoltaic System For Remote Villages along the Amazon River in Nauta, Peru**
Michael Boller, George Fox University, USA
Chad Stillinger, George Fox University, USA
Joel McGee, JungleMaster Ministries, USA
Ben Giudice, George Fox University, USA

14:15
**Energy harvesting controls for solar direct-drive medical cold chain equipment**
Daniel Myers, PATH, USA
Steven P Diesburg, PATH, USA
Steve McCarney, Solar Electric Light Fund, USA
Pat Lennon, PATH, USA
14:30
Solar Powered Observatory For Educational Activities
Sarah Awara, University of Calgary, Canada
Abdul Rafae, University of Calgary, Canada
David Christopher Garrett, University of Calgary, Canada
Anis Ben Arfi, University of Calgary, Schulich School of Engineering & iRadio, Canada

14:45 - 15:00
Q&A Opportunity

13:30 – 15:00
B3: Agriculture and Food Security
Room: Carmel
Session Chair: Joan Kerr

13:30
Design of a Passive Irrigation Controller for Efficient Water Usage in Low Income Countries
Anna Jiang, University of Toronto, Canada
Amy Bilton, University of Toronto, Canada

13:45
Ethics Code for Genetically Modified Ornamental and Landscape Plants
Hussein Abaza, Kennesaw State University, USA

14:00
An Internet of Things (IoT)-based Aquaponics Facility
Shiny Abraham, Seattle University, USA
Phillip Thompson, Seattle University, USA
Armand Shahbazian, Seattle University, USA
Kevin Dao, Seattle University, USA
Han Tran, Seattle University, USA

14:10
Lessons learnt from post analysis study of Solar Tunnel Dryers in date palm cluster of district Khairpur, Sindh in Pakistan: A recommended structure on Capacity building model for date palm producers to preserve food security
Khalil Ahmed, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan
Asif Ali Shah, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan
Sarang Shaikh, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan

14:20
ShareSpare: Building Leftover Network with Self-Moderation and Incentives
Rakshit Agrawal, University of California, Santa Cruz, USA

14:30
Development and Evaluation of Drone Mounted Sprayer for Pesticide Applications to Crops
Yallappa D., College of Agricultural Engineering, University of Agricultural Science
M. Veerangouda, College of Agricultural Engineering, University of Agricultural Science
Devanand Maski, College of Agricultural Engineering, University of Agricultural Science
Vijayakumar Palled, College of Agricultural Engineering, University of Agricultural Science
M. Bheemanna, College of Agricultural Engineering, University of Agricultural Science

14:45 - 15:00
Q&A Opportunity
13:30 – 15:00
B4: Water and Sanitation
Room: Monterey
Session Chair: Bob Wubbena & Alexander Anderson

13:30
Aquasift: A Low-Cost, Hand-Held Potentiostat for Point-Of-Use Electrochemical Detection of Contaminants in Drinking Water
Philip Wu, Santa Clara University, USA
Gabriela Vazquez, Santa Clara University, USA
Nicholas Mikstas, Santa Clara University, USA
Shoba Krishnan, Santa Clara University, USA
Unyoung Kim, Santa Clara University, USA

13:45 **Remote Presentation
An Internet of Things (IoT) based Sustainable Water Management
Sreekanth Narendran, Amrita School of Engineering & Amrita Vishwa Vidyapeetham, India
Preeja Pradeep, Amrita School of Engineering, Amritapuri, Amrita Vishwa Vidyapeetham, India
Maneesha Vinodini Ramesh, Amrita Vishwa Vidyapeetham, Amrita University, India

14:00
An Approach for Crack Detection in Sewer Pipes Using Acoustic Signals
Muhammad Safeer Khan, Arkansas Tech University, USA

14:15
Stabilized Hypochlorous Acid Disinfection For Highly Vulnerable Populations
Eric Rasmussen, Briotech, Incorporated & Infinitum Humanitarian Systems, USA
Jeffrey F Williams, Briotech Inc & OxiScience LLC, USA

14:30 **Remote Presentation
Transforming Urban Waste into Construction blocks for a Sanitation Infrastructure: A Step towards addressing Rural Open Defecation
Harish Mohan, Ammachi Labs, Amrita Vishwa Vidyapeetham, Amritapuri, India
Lauriane Masson, Ecole Polytechnique Federale De Lausanne (EPFL), India
Sreevalsa Kolathayar, Amrita University, Amrita Vishwa Vidyapeetham, India
Renjith Mohan, Amrita Vishwa Vidyapeetham, India
Anil Kumar Sharma, Amrita Vishwa Vidyapeetham, India
Aswathy K, Khiviya Kamalasekar, Amrita VishwaVidyapeetham, India
Kalathuru M, Amrita VishwaVidyapeetham, India

14:45- 15:00
Q&A Opportunity

13:30 – 15:00
B5: Humanitarian Challenges and Opportunities
Room: San Carlos
Session Chair: Khanjan Mehta

13:30
From crisis management to humanitarian technology - a European perspective
Stefan Voigt, German Aerospace Centre (DLR), Germany
Konstanze Lechner, German Aerospace Center (DLR), Germany
Elisabeth Schoepfer, German Aerospace Center (DLR), Germany
Guenther Strunz, German Aerospace Centre (DLR), Germany
**Remote Presentation**

**Sustainable development through the use of solar energy for productive processes: the Ayllu Solar Project**
Pauina Ramírez Del Barrio, *University of Chile, Chile*
Patricio Mendoza-Araya, *University of Chile, Chile*
Felipe Valencia Arroyave, *Solar Energy Research Center, SERC-Chile & University of Chile, Chile*
Gonzalo León, *University of Chile, Chile*
Lorena Cornejo Ponce, *University of Tarapacá, Chile*
Marcia Montedónico, *University of Chile, Chile*
Guillermo Jiménez Estévez, *University of Chile, Chile*

**14:00**

**Biochar production and characterization - a field study**
Mathu Indren, *The University of Adelaide, Australia*
Nishanth Cheruvu, *The University of Adelaide, Australia*
Cris Birzer, *The University of Adelaide, Australia*
Paul Medwell, *The University of Adelaide, Australia*

**14:15**

**3D Printing Braille Maps for Texas A&M University**
Jim Wilson, *Texas A&M University-EIC & Texas A&M University-EIC, USA*
Tyler Wooten, *Texas A&M University, USA*

**14:30**

**SCAN - Automatizing Libraries in African Villages**
Matthew Johnson, *Santa Clara University, USA*
Jose Santillan, *Santa Clara University, USA*
Michael Walsh, *Santa Clara University, USA*
Silvia Figueira, *Santa Clara University, USA*

**14:45- 15:00**

**Q&A Opportunity**

**15:00 – 15:30**

**Break**
Room: *Poolside Foyer*

**16:00 – 17:30**

**C1: mhealth**
Room: *San Jose*

**Session Chair: Alan Mickelson**

**16:00**

**mHealth4Afrika Alpha Validation in Rural and Deep Rural Clinics in Ethiopia, Kenya, Malawi and South Africa**
Miriam Cunningham, *IIMC / mHealth4Afrika / IST-Africa, Ireland*
Paul M Cunningham, *IIMC / mHealth4Afrika / IST-Africa, Ireland*
Darelle van Greunen, *Nelson Mandela University, South Africa*
Alida Veldsman, *Nelson Mandela University, South Africa*
Chipo Kanjo, *Chancellor College, University of Malawi*
Emmanuel Kweyu, *@iLabAfrica, Strathmore University, Kenya*
Binyam Tilahun, *University of Gondar, Ethiopia*

**16:15**

**A design of a mobile health (mHealth) intervention for the prevention and treatment of Cholera in South Kivu in the Democratic Republic of Congo**
Itulelo Imaja, *University of KwaZulu-Natal, South Africa*
Patrick Ndayizigamiye, *University of KwaZulu-Natal, South Africa*
Manoj Maharaj, *University of KwaZulu-Natal, South Africa*
16:30 **Remote Presentation

QoS based Telemedicine Technologies for Rural Healthcare Emergencies
Adwitiya Mukhopadhyay, Amrita Vishwa Vidyapeetham, Amrita University, India
Maneesha Vinodini Ramesh, Amrita Vishwa Vidyapeetham, Amrita University, India

16:45
A design of a mobile health (mHealth) intervention to enhance home careers' disposal of medical waste in South Africa
Patrick Ndayizigamiye, University of KwaZulu-Natal, South Africa
Lydia Hangulu, University of KwaZulu-Natal, South Africa
Olagoke Akintola, University of KwaZulu-Natal, South Africa

17:00 **Remote Presentation

Whole Person Integrated Care (WPIC): A Healthcare Transformation Strategy Supported by a Novel Spreadsheet-Based Software Framework
Stephen E. Beller, National Health Data Systems, USA
Sabatini Monatesti, ES Enterprises, Inc, USA
Peter Bachman, Cequs, Inc., USA

17:00 – 17:30
Q&A Opportunity

16:00 – 16:45
C2a: Panel: Social and Economic Development of Rural Women in Rwanda and Uganda through Solar Energy for Productive Use
Room: Santa Clara
Moderator: Monica Brown

16:00
Social and Economic Development of Rural Women in Rwanda and Uganda through Solar Energy for Productive Use
Monica Brown, Africa Development Promise & Posner Center for International Development, USA
Sherina Munyana, Africa Development Promise - Uganda, Uganda

16:45 – 17:30
C2b: Panel: Opportunities and Challenges of distributed manufacturing for humanitarian response
Room: Santa Clara

16:45 – 17:30
Opportunities and challenges of distributed manufacturing for humanitarian response
Laura James, Field Ready, United Kingdom, Great Britain

16:00 – 17:30
C3: Agriculture
Room: Carmel
Session Chair: Joan Kerr

16:00
Contributions of Post-harvesting Technologies in alleviating poverty: A case study of date palm cluster in Khairpur District, Sindh, Pakistan
Khaliil Ahmed, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan
Sarang Shaikh, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan
Asif Ali Shah, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan

16:15
Mushroom Cultivation in the Developing World: A Comparison of Cultivation Technologies
Connor Higgins, The Pennsylvania State University, USA
Hartini Margot, The Pennsylvania State University, USA
Sara Warnquist, The Pennsylvania State University, USA
Eric Obeysekare, Pennsylvania State University, USA
Khanjan Mehta, Lehigh University, USA
16:30
Small Scale Mushroom Production Systems in Rural Cambodia
Bryant Lindsay, Lehigh University, USA
Lauren Fosbenner, Lehigh University, USA
Samuel Evers, Lehigh University, USA
Timothy Predmore, Lehigh University, USA
Sanjana Shree Chintalapudi, Lehigh University, USA
Khanjan Mehta, Lehigh University, USA

16:40 – 17:00
Q&A Opportunity

16:00 – 17:30
C4: The IEEE MOVE Disaster Relief Project “in a box” Workshop
Room: Monterey

16:00
The IEEE Modular MOVE Disaster Relief Project
James M. Conrad, University of North Carolina at Charlotte, USA
A’lishia Bowman, University of North Carolina at Charlotte, USA
Henrique Weh, Central Piedmont Community College, USA
Tomas Ortiz, Central Piedmont Community College, USA
Mary Ellen Randall, Ascot Technologies, USA
Grayson W. Randall, Ascot Technologies, USA
Gregg Vaughn, University of Alabama Birmingham, USA

16:45
The IEEE MOVE Disaster Relief Vehicle: Lessons Learned from One Year of Operation
James M. Conrad, University of North Carolina at Charlotte, USA
Mary Ellen Randall, Ascot Technologies, USA
Grayson W. Randall, Ascot Technologies, USA
Gregg Vaughn, University of Alabama Birmingham, USA
Percy F. Shadwell, Jr., Shadwell Technical Services, USA

16:00 – 17:30
C5: Humanitarian Challenges and Opportunities
Room: San Carlos
Session Chair: Khanjan Mehta

16:00
Education in an Extreme Environment: a University in a Refugee Camp
Suzana Brown, SUNY Korea, State University of New York & Stony Brook University, NY, Korea
Martin Saint, Carnegie Mellon University & University of Colorado Boulder, USA
Chrystina Russell, Southern New Hampshire University, USA

16:15
Development of a Block Level Geovisualization Tool of Zaatari Refugee Camp Community Asset Data
Daniel Mooney, Rochester Institute of Technology, USA
Brian Tomaszewski, Rochester Institute of Technology, USA
Bryan French, Rochester Institute of Technology, USA

16:30
Spatial data in the Global South: a case study of alternative land management tools for cities with limited resources
Leticia Palazzi Perez, UFABC & FCTH USP, Brazil
Raphael Bischof Santos, UFABC, Brazil
Guilherme Carpintero Carvalho, UFABC, Brazil
Guadalupe Almeida, UFABC, Brazil
16:45 **Remote Presentation**
Dynamic Traffic Light System for Unhindered Passing of High Priority Vehicles
Athul Krisha A, Kerala Technological University & College of Engineering Trivandrum, India
Bharath Kartha Kerala Technological University, India
Vishnu S Nair, Kerala Technological University, India

17:00
FREIDA (Framework of Resources for modeling Energy/Environmental/Economic Impacts of Development and Advancements) in Ports
Rubenka Bandyopadhyay, Oak Ridge Associated Universities & ORISE Participant, USA
Ozge Kaplan, US Environmental Protection Agency, USA
Rochelle Araujo, US Environmental Protection Agency, USA
Rebecca Dodder, US Environmental Protection Agency, USA
Elizabeth Smith, US Environmental Protection Agency, USA

17:15 – 17:30
Q&A Opportunity

18:00 – 18:30
Break | **No Food and Beverage Provided**
Room: Poolside Foyer

18:30 – 21:00
SIGHT Reception
Room: Sierra/Cascade/Siskiyou
### Saturday, October 21, 2017

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<tr>
<th>Time</th>
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<tr>
<td>07:00 - 18:00</td>
<td>Registration</td>
<td>Bayshore Foyer</td>
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<tr>
<td>08:00-09:30</td>
<td>Opening Keynote Dr. Darelle Van Greunen</td>
<td>Sierra/Cascade/Siskiyou</td>
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<td><strong>Disruptive Innovation- advances that transform lives</strong></td>
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<td>Dr. Darelle Van Greunen</td>
<td>Nelson Mandella University</td>
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<td></td>
<td><strong>Abstract:</strong> The Internet of Everything, autonomous means of transport and personalized robots have the potential to reshape the world we live and work in. Not only should we know what is on the horizon but also start preparing for its impact. The tsunami parade of new technologies is impacting on many fronts. Most advances are labelled as a breakthrough or “the next big thing”. Of course, not all technologies will impact the business or social landscape, but some have the potential to disrupt the status quo, altering the way people live and work. During this talk, I intend to cut through the noise and to highlight some of the most disruptive innovations that can transform our lives.</td>
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<tr>
<td>08:00 – 09:30</td>
<td>IEEE Area Meeting</td>
<td>San Carlos</td>
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<tr>
<td>08:00 – 09:30</td>
<td>IEEE Area Meeting</td>
<td>San Juan</td>
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</tbody>
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10:00 - 11:30
D1: Diagnosis and Screening
Room: San Jose
Session Chair: Silvia Figueria

10:00
Vital Sensor Kit for Use with Telemedicine in Developing Countries
Alejandra Pacheco, Santa Clara University, USA
Antonio Maldonado-Liu, Santa Clara University, USA
Jose Hernandez, Santa Clara University, USA
Natalie Arrizon, Santa Clara University, USA
Tokunbo Ogunfunmi, Santa Clara University, USA
Unyoung Kim, Santa Clara University, USA

10:15
Stetho-phone: Low-cost Digital Stethoscope for Remote Personalized Healthcare
Shaikh Anowarul Fattah, BUET, Bangladesh
Sayeed Shafayet Chowdhury, Bangladesh University of Engineering and Technology, Bangladesh
Celia Shahnaz, BUET, Bangladesh
Rakibul Islam Chowdhury, BUET, Bangladesh
Ahmed Maksud, Bangladesh University of Engineering and Technology, Bangladesh
Md Shariful Islam, BUET, Bangladesh
Nael Mizanur Rahman, Bangladesh University of Engineering and Technology, Bangladesh

10:30
Use of Cough Sounds for Diagnosis and Screening of Pulmonary Disease
Christian Infante, MIT, USA
Daniel Chamberlain, Massachusetts Institute of Technology, USA
Yogesh Thorat, Chest Research Foundation, India
Rahul Kodgule, Chest Research Foundation, India
Richard Fletcher, MIT, USA

10:45
Wrist-Card: PPG Sensor based Wrist Wearable Unit for Low Cost Personalized Cardio Healthcare System
Shaikh Anowarul Fattah, BUET, Bangladesh
Mohammad Rahman, Bangladesh University of Engineering and Technology, Bangladesh
Nafis Mustakin, Bangladesh University of Engineering and Technology, Bangladesh
Mohammad Tariqul Islam, Bangladesh University of Engineering and Technology, Bangladesh
Asir Intisar Khan, Bangladesh University of Engineering and Technology, Bangladesh
Celia Shahnaz, BUET, Bangladesh

11:00
Urinary Tract Infections (UTIs) in Rural Kenya: Screening Challenges, Treatment Pathways and Technological Solutions
Grace Warkulwiz, Penn State University, USA
Kaylyn Hannon, Penn State University, USA
Khanjan Mehta, Lehigh University, USA

11:15 - 11:30
Q&A Opportunity
10:00 – 11:30  
**D2: Energy Management**  
**Room:** Santa Clara  
**Session Chair:** Bai Blyden

10:00
**Rural Indian Microgrid Design Optimization - Intelligent Battery Sizing**
Gandhi Rajan Ramachandran, **Solarillion Foundation, India**  
Meghana Kavakuntala, **SRM University, India**  
Vetrivel Subramaniam Rajkumar, **Anna University, India**  
Sivaroophini Gnanavel, **Anna University, India**  
Vineeth Vijayaraghavan, **Solarillion Foundation, India**

10:15
**Development of a Small-Scale Solar Thermochemical Energy Storage System**
Griffin Drake, **Oregon State University, USA**  
Kyle Harris, **Oregon State University, USA**  
Monica Heng, **Oregon State University, USA**  
Ben A. Appleby, **Oregon State University, USA**  
Lucas Freiberg, **Oregon State University, USA**  
Philip Harding, **Oregon State University, USA**  
Nick AuYeung, **Oregon State University, USA**

10:30 **Remote Presentation**
**Assessing Village Power Grid Problems for Development of Quality and Stable Supplemental Sustainable Energy**
Vivek Mohan, **Amrita Vishwa Vidyapeetham, Amrita University, India**  
Vidal Conejo-Garcia, **Polytechnic University of Catalonia, Spain**  
Renjith Mohan, **Amrita Vishwa Vidyapeetham, India**  
Malini LM Frey, **Amrita University, India**  
Manoj Pokkiyarath, **Amrita Vishwa Vidyapeetham & Amrita University, India**  
Sai Shibu N B, **Amrita Vishwa Vidyapeetham, India**  
Maneesha Vinodini Ramesh, **Amrita Vishwa Vidyapeetham, Amrita University, India**  
Aryadevi Remanidevi Devidas, **Amrita Vishwa Vidyapeetham & Amrita University, India**

10:45
**Technical Standards for PV / Storage / Generator Microgrids**
Douglas Danley, **NRECA, USA**

11:00
**Green Energy Distribution in Haiti**
Arturo Freydig Avila, **University of Colorado at Boulder, USA**  
Rick Wallace Kenyon, **University of Colorado at Boulder, USA**  
Alan Mickelson, **University of Colorado at Boulder, USA**

11:15- 11:30
**Q&A Opportunity**
10:00 – 11:30
D3: Communication Networks
Room: Carmel

10:00
University of Colorado at Boulder WiLDNet Testbed
Rick Wallace Kenyon, University of Colorado at Boulder, USA
Alan Mickelson, University of Colorado at Boulder, USA
Nicholas Bollen, University of Colorado at Boulder, USA
Chris Dizon, University of Colorado at Boulder, USA
Bennett Miller, University of Colorado at Boulder, USA
Heinz Boehmer Fiehn, University of Colorado at Boulder, USA
Mark Hinkle, University of Colorado at Boulder, USA
Kaitlin Y Mazotti, University of Colorado at Boulder, USA
Stefano Costa, University of Colorado at Boulder, USA

10:15
Communication Networking in the Highlands of Papua New Guinea
Alan Mickelson, University of Colorado at Boulder, USA
Rick Wallace Kenyon, University of Colorado at Boulder, USA
Alexander Anderson, Odin Energy Works LLC, USA
Daniel Wessner, Regis University, USA
Bennett Miller, University of Colorado at Boulder, USA

10:30
Self-Configuring Heterogeneous HF/UHF/Wi-Fi Disaster Communications Networks
Kimberley Hawtin, Flinders University, Australia
Paul Gardner-Stephen, Flinders University, Australia

10:45
Eliminating the high stand-by energy consumption of ad-hoc Wi-Fi
Watcharachai Kongsiriwattana, Flinders University, Australia
Paul Gardner-Stephen, Flinders University, Australia

11:00
Scalable Telecommunications over Ultra-Low-Bandwidth Radio Backbones
Ghassan Al-Nuaimi, Flinders University, Australia
Romana Challans, Flinders University of South Australia, Australia
Jeremy Lakeman, Flinders University of South Australia, Australia
Paul Gardner-Stephen, Flinders University, Australia

11:15- 11:30
Q&A Opportunity
10:00
Demonstrations of Post-Disaster Resilient Communications and Decision-Support Platform with UAVs, Ground Teams and Vehicles using Delay-Tolerant Information Networks on Sub-GHz Frequencies
Gemalyn Abrajano, Ateneo de Manila University & Ateneo Innovation Center, Philippines
Chrisandro Favila, Ateneo Innovation Center, Philippines
Chiang-Yi Luo, Toyota Infotech Center, Japan
Edgar Marko Trono, Nara Institute of Science and Technology, Japan
Daniel Lagazo, Ateneo, Philippines
Benjz Sevilla, DICT, Philippines
Jaime Luis E Honrado, Ateneo de Manila University & Skyeye, Inc., Philippines
Dominic B. Solpico, Ateneo de Manila University & Skyeye, Inc., Philippines
Joshua Yu, Ateneo de Manila University, Philippines
Kyle Chua, Ateneo de Manila University, Philippines
John Paul Mamaraadio, Ateneo de Manila University, Philippines
Carlex Jose II, Ateneo de Manila University, Philippines
Jherrielloyd Yao, Ateneo de Manila University, Philippines
Jane Arleth L dela Cruz, Ateneo de Manila University & Ateneo Innovation Center, Philippines
Elice Ancheta, Ateneo de Manila University, Philippines
April Domingo, Ateneo de Manila University, Philippines
Matthew Ong, Ateneo de Manila University, Philippines
Jynariz Datuin, Ateneo de Manila University, Philippines
Keiichi Yasumoto, Nara Institute of Science and Technology, Japan
Nathaniel Libatique, Ateneo de Manila University, Philippines
Gregory Tanganon, Ateneo Innovation Center, Philippines

10:15
Historical Distribution of Duration of Unplanned Power Outages in Queensland: Insights for sustaining telecommunications during disasters
Watcharachai Kongsiriwattana, Flinders University, Australia
Paul Gardner-Stephen, Flinders University, Australia
Matthew Lloyd, New Zealand Red Cross, New Zealand

10:30
Design and development of the water supply system for the Red Cross Field Hospital
Yasuhiro Soshino, Japanese Red Cross Kumamoto Hospital, Japan
Akira Miyata, Japanese Red Cross Kumamoto Hospital, Japan

10:45
Malasakit 1.0: A Participatory Online Platform for Crowdsourcing Disaster Risk Reduction Strategies in the Philippines
Brandie Nonnecke, UC Berkeley, USA
Shrestha Mohanty, University of California, Berkeley, USA
Andrew Lee, University of California, Berkeley, USA
Jonathan Lee, University of California, Berkeley, USA
Sequoia Beckman, University of California, Berkeley, USA
Justin Mi, University of California, Berkeley, USA
Sanjay Krishnan, UC Berkeley, USA
Rachel Edita Roxas, National University, Philippines
Nathaniel Oco, De La Salle University, Philippines
Camille Crittenden, UC Berkeley CITRIS, USA
Ken Goldberg, UC Berkeley, USA
11:00
Social Media for Disaster Situations Methods, Opportunities and Challenges
Alivelu Mukkamala, IT University of Copenhagen, Denmark
Roman Beck, IT University of Copenhagen, Denmark

11:15
Top-down and bottom-up - A global approach to strengthen local disaster resilience
Markus Enenkel, SOS Children's Villages International & Columbia University, Int. Research Institute for Climate and Society, Austria
Andreas Papp, SOS Children's Villages International, Austria
Elisabeth Veith, SOS Children's Villages International, Austria
Stefan Voigt, German Aerospace Centre (DLR), Germany

11:25-11:30
Q&A Opportunity

10:00 – 11:30
D5: IEEE Area Meeting
Room: San Carlos

10:00 – 11:30
D6: IEEE Area Meeting
Room: San Juan

11:30 – 12:30
Panel Session: Healthcare
Room: Sierra/Cascade/Siskiyou
Moderator: Paul Cunningham
Panelists: Anurag Mairal, Director of Global Outreach Programs, Byers Center for Biodesign, Stanford University
Praveen Raja, Vice President for Technology Development and Introduction, PATH
Akos Somoskovi, Respiratory Medicine Lead, Global Health Technologies, Global Good Fund, Intellectual Ventures Laboratory

12:30 – 13:30
Lunch
Room: Sierra/Cascade/Siskiyou

13:30 – 15:00
E1: Surgical and other Healthcare Issues
Room: San Jose
Session Chair: Paul Cunningham

13:30
Prototype telepathology solutions that use the Raspberry Pi and mobile devices
Donald Ekong, Mercer University, USA
Paul Fontelo, National Library of Medicine, National Institutes of Health, USA

13:45
SurgiBox: An Ultra-portable System to Improve Surgical Safety for Patients and Providers in Austere Settings
Debbie Teodorescu, MIT D-Lab & Project SurgiBox, USA
Sally Miller, MIT, USA
Sashidhar Jonnalagedda, EssentialTech, USA
Robert Smalley, Harvard Medical School, USA
14:00
Real time injecting device with automated robust vein detection using near infrared camera and live video
Tamim Ahmed, Bangladesh University of Engineering and Technology, Bangladesh
Khandker Sadia Rahman, Bangladesh University of Engineering and Technology, Bangladesh
SK Subrina Shawlin, Bangladesh University of Engineering and Technology, Bangladesh
Mohammad Hasan, Bangladesh University of Engineering and Technology, Bangladesh
Arnab Bhattacharjee, Bangladesh University of Engineering and Technology, Bangladesh
Shaikh Anowarul Fattah, BUET, Bangladesh
Celia Shahnaz, BUET, Bangladesh

14:15
iSeiz: A Low-Cost Real-Time Seizure Detection System Utilizing Cloud Computing
Farid Farahmand, Sonoma State University, USA
Aaron Marquez, Sonoma State University, USA
Michael Dunn, Sonoma State University, USA
Jaime Ciriaco, Sonoma State University, USA

14:30
Design and Calibration of a Wearable and Wireless Research Grade Air Quality Monitoring System for Real-Time Data Collection
Hannaneh Hojaiji, University of California, Los Angeles, USA
Orpaz Goldstein, UCLA, USA
Christine King, UCLA, USA
Majid Sarrafzadeh, UCLA, USA
Michael Jerrett, UCLA, USA

14:45 – 15:00
Q&A Opportunity

13:30 – 15:00
E2: Off-Grid and Electrification Planning
Room: Santa Clara
Session Chair: Bai Blyden

13:30
A Low-Power Thermoelectric Generator for Off-Grid Power in the aftermath of Natural Disasters
Jamison Olsten, Colorado School of Mines, USA
Salman Mohagheghi, Colorado School of Mines, USA

13:45
Statistical Failure Estimation Method to Size Off- Grid Electrical Systems for Villages in Rwanda
Sri Harika Kuppa, Colorado State University, USA
Daniel Zimmerle, Colorado State University, USA

14:00
A geospatial framework for electrification planning in developing countries
Jason Adkins, Columbia University School of Engineering and Applied Sciences (SEAS), USA
Vijay Modi, Columbia University School of Engineering and Applied Sciences (SEAS), USA
Ayse Selin Kocaman, Bilkent University, Turkey
Roy Han, Independent, USA
Shaky Sherpa, Columbia University School of Engineering and Applied Sciences (SEAS), USA
Naichen Zhao, Columbia University School of Engineering and Applied Sciences (SEAS), USA
Jonathan Carbajal, Columbia University School of Engineering and Applied Sciences (SEAS), USA
Chris Natali, Columbia University School of Engineering and Applied Sciences (SEAS), USA

14:15
From Electrification to Empowerment: Re-Defining Energy Access in Frontier Markets
Frank Bergh, Sigora International & Engineers Without Borders USA, USA
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:30</td>
<td><strong>Remote Presentation</strong></td>
<td>Design and Simulation of an Integrated PV Solar Electric System&lt;br&gt;Pritpal Singh, Villanova University, USA&lt;br&gt;Rita Atallah, Villanova University, USA</td>
</tr>
<tr>
<td>14:45 – 15:00</td>
<td>Q&amp;A Opportunity</td>
<td></td>
</tr>
<tr>
<td>13:30 – 15:00</td>
<td><strong>Remote Presentation</strong></td>
<td>E3: Communications&lt;br&gt;Room: Carmel</td>
</tr>
<tr>
<td>13:30</td>
<td><strong>Remote Presentation</strong></td>
<td>Remote Environmental Monitoring using Internet of Things (IoT)&lt;br&gt;Shiny Abraham, Seattle University, USA&lt;br&gt;Joshua Beard, Seattle University, USA&lt;br&gt;Renjith Manijacob, F5 Networks, USA</td>
</tr>
<tr>
<td>13:45</td>
<td><strong>Remote Presentation</strong></td>
<td>Towards Energy conservation in Campus using Wireless Sensor Network&lt;br&gt;Dhivvya J Parasuraman, Amrita Center for Wireless Networks &amp; Applications (AmritaWNA) &amp; Amrita Vishwa Vidyapeetham, India&lt;br&gt;Maneesha Ramesh, Amrita University, India&lt;br&gt;Divya P, Amrita School of Engineering, India&lt;br&gt;Jayakrishnan V M, Amrita Vishwa Vidyapeetham, India</td>
</tr>
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<td>14:00</td>
<td><strong>Remote Presentation</strong></td>
<td>Remote Presentation&lt;br&gt;Towards Energy conservation in Campus using Wireless Sensor Network&lt;br&gt;Dhivvya J Parasuraman, Amrita Center for Wireless Networks &amp; Applications (AmritaWNA) &amp; Amrita Vishwa Vidyapeetham, India&lt;br&gt;Maneesha Ramesh, Amrita University, India&lt;br&gt;Divya P, Amrita School of Engineering, India&lt;br&gt;Jayakrishnan V M, Amrita Vishwa Vidyapeetham, India</td>
</tr>
<tr>
<td>14:15</td>
<td><strong>Remote Presentation</strong></td>
<td>Zero Recurrent-Cost Two-Way Satellite Communications for Humanitarian Applications&lt;br&gt;Matthew Lloyd, Flinders University&lt;br&gt;Angus Wallace, Flinders University, Australia&lt;br&gt;Paul Gardner-Stephen, Flinders University, Australia</td>
</tr>
<tr>
<td>14:30</td>
<td><strong>Remote Presentation</strong></td>
<td>Piloting the Serval Mesh and Serval Mesh Extender 2.0 in Vanuatu: Preliminary Results&lt;br&gt;Paul Gardner-Stephen, Flinders University, Australia&lt;br&gt;Salma Farouque, Flinders University, Australia&lt;br&gt;Andrew Bate, New Zealand Red Cross, New Zealand&lt;br&gt;Matthew Lloyd, New Zealand Red Cross, New Zealand&lt;br&gt;Alexis Cullen, Flinders University</td>
</tr>
<tr>
<td>14:30</td>
<td><strong>Remote Presentation</strong></td>
<td>Study and Analysis of OceanNet - Marine Internet Service for Fishermen&lt;br&gt;A Karthik, Center for Wireless Networks and Applications, Amrita University, India&lt;br&gt;Lakshmi Rajagopal, Center for Wireless Networks and Applications, Amrita University, India&lt;br&gt;Deepu Koshi, Center for Wireless Networks and Applications, Amrita University, India&lt;br&gt;Anjana Luke, Center for Wireless Networks and Applications, Amrita University, India&lt;br&gt;Meera S, Center for Wireless Networks and Applications, Amrita University, India&lt;br&gt;Sai Shibu N B, Center for Wireless Networks and Applications, Amrita University, India</td>
</tr>
<tr>
<td>14:45 – 15:00</td>
<td>Q&amp;A Opportunity</td>
<td></td>
</tr>
</tbody>
</table>
13:30 – 15:00  
E4: Disaster Management  
Room: Monterey  
Session Chair: Roger Johnson

13:30  
HydroMet: Deployment of a Large Scale Nationwide Hydrometeorological Sensor Network for Flood Warning and Monitoring  
Alvin Retamar, Advanced Science and Technology Institute, Philippines  
Glenn Vincent Lopez, Advanced Science and Technology Institute, Philippines  
Felan Carlo Garcia, Ateneo de Manila University, Philippines  
Jeanette Badong-Carlos, Advanced Science and Technology Institute, Philippines  
Marjon De Paz, Advanced Science and Technology Institute, Philippines  
Ian Mosquera, Advanced Science and Technology Institute, Philippines  
Jasmine Jane Yabut, Advanced Science and Technology Institute, Philippines  
Jericho Capito, Advanced Science and Technology Institute, Philippines  
Joven Javier, Advanced Science and Technology Institute, Philippines  
Harold Bryan Paler, Advanced Science and Technology Institute, Philippines  
Gerwin Guba, Advanced Science and Technology Institute, Philippines

13:45 **Remote Presentation**  
Damage Identification and Assessment using Image Processing on Post-Disaster Satellite Imagery  
Aparna R. Joshi, National Institute of Technology Karnataka, Surathkal, India  
Isha Tarte, National Institute of Technology Karnataka, Surathkal, India  
Sreeja Suresh, National Institute of Technology Karnataka, Surathkal, India  
Shashidhar G. Koolagudi, National Institute of Technology Karnataka, India

14:00  
Intelligent Seeker Robot to Locate Dead Bodies and Survivors under Debris  
Md Tahmid Rashid, Northern University Bangladesh  
Syed Ayaz Mahmud, Bangla Trac Communication Ltd., Bangladesh

14:15  
Robot Ropes for Disaster Response Operations  
Michael Wooten, Clemson University, USA  
Ian D Walker, Clemson University, USA

14:30  
Integrated Disaster Risk Management in Indian Environment-Prediction, Prevention and Preparedness  
Adil Usman, Indian Institute of Technology Mandi, India

14:40 – 15:00  
Q&A Opportunity

13:30 – 15:00  
E5: IEEE Area Meeting  
Room: San Carlos

13:30 – 15:00  
E6: IEEE Area Meeting  
Room: San Juan
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Session Chair</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:00</td>
<td>F1: Health</td>
<td>San Jose</td>
<td>Silvia Figueria</td>
<td>Managing Child Malnutrition via Digital Enablement: Insights from a Field Trial</td>
<td>Anutosh Maitra, Accenture Services Pvt. Ltd., INDIA, India&lt;br&gt;Nataraj Kuntagod, Accenture, India&lt;br&gt;Rambhau Rote, Accenture, India</td>
</tr>
<tr>
<td>16:15</td>
<td>F1: Health</td>
<td>San Jose</td>
<td>Silvia Figueria</td>
<td>Selecting analytical biomarkers for developing diagnostic technologies for global health applications</td>
<td>Samantha Byrnes, Intellectual Ventures Laboratory, USA&lt;br&gt;Bernhard Weigl, Intellectual Ventures Laboratory, USA</td>
</tr>
<tr>
<td>16:25</td>
<td>F1: Health</td>
<td>San Jose</td>
<td>Silvia Figueria</td>
<td>Situated Big Data and Big Data Analytics for Healthcare</td>
<td>Mark Sterling, Nazarbayev University, Kazakhstan</td>
</tr>
<tr>
<td>16:35</td>
<td>F1: Health</td>
<td>San Jose</td>
<td>Silvia Figueria</td>
<td>Multiplatform application for postural analysis</td>
<td>Adjamilton Mederios de Almeida Junior, Instituto Federal de Educacao, Ciencia e Tecnologia da Paraiba, Brazil&lt;br&gt;Rychard Nunes Guedes, Instituto Federal de Educacao, Ciencia e Tecnologia da Paraiba, Brazil&lt;br&gt;Wesley de Cunha Santos, Instituto Federal de Educacao, Ciencia e Tecnologia da Paraiba, Brazil&lt;br&gt;Ana Regis, Sunare, Brazil&lt;br&gt;Carlos Danilo Regis, IFPB &amp; lecom Brazil</td>
</tr>
<tr>
<td>16:50</td>
<td>F1: Health</td>
<td>San Jose</td>
<td>Silvia Figueria</td>
<td>Q&amp;A Opportunity</td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td>F2: Energy Sources</td>
<td>Santa Clara</td>
<td>Adil Usman</td>
<td>Performance Testing and Techno-Economic Analysis to Improve an Affordable Charcoal Cookstove</td>
<td>Daniel Sweeney, Massachusetts Institute of Technology, USA&lt;br&gt;Lauren Bustamante, Massachusetts Institute of Technology, USA&lt;br&gt;Betty Ikalany, TEWDI Uganda, Uganda&lt;br&gt;Helen Acuku, TEWDI Uganda &amp; Appropriate Energy Saving Technologies (AEST) LTD, Uganda</td>
</tr>
<tr>
<td>16:15</td>
<td>F2: Energy Sources</td>
<td>Santa Clara</td>
<td>Adil Usman</td>
<td>Extrusion Auger Improvement Project</td>
<td>Aaron Wagner, Santa Clara University, USA&lt;br&gt;Maureen O'Neill, Santa Clara University, USA&lt;br&gt;Panthea Sepehrband, Santa Clara University, USA</td>
</tr>
<tr>
<td>16:30</td>
<td>F2: Energy Sources</td>
<td>Santa Clara</td>
<td>Adil Usman</td>
<td>A Global Market Assessment Methodology for Small Wind in the Developing World</td>
<td>Alfred Alsop, University of Strathclyde, United Kingdom, Great Britain&lt;br&gt;Aran Eales, University of Strathclyde, United Kingdom, Great Britain&lt;br&gt;Scott Strachan, University of Strathclyde, USA&lt;br&gt;Jon Leary, University of Loughborough, United Kingdom, Great Britain&lt;br&gt;Jon Persson, Wind Empowerment, Sweden&lt;br&gt;Isabel Ruiz Almeyda, Wind Empowerment, The Netherlands</td>
</tr>
</tbody>
</table>
16:45
Optimal Power Flow for Micro-grids
Blair Hanna, Georgia Southern University, USA
Adel El Shahat, Georgia Southern University, USA

17:00
Electricity Technology Needs for Energy Access
Bruce Nordman, Lawrence Berkeley National Laboratory, USA
Aditya Khandekar, Lawrence Berkeley National Laboratory, USA

17:10- 17:30
Q&A Opportunity

16:00 – 17:30
F3: Communication
Room: Carmel

16:00
Architecture for Responsive Emergency Communications Networks
Patrick Lieser, Technische Universität Darmstadt, Germany
Flor Alvarez, Technische Universität Darmstadt & Secure Mobile Networking Lab, Germany
Paul Gardner-Stephen, Flinders University, Australia
Matthias Hollick, Technische Universität Darmstadt & Secure Mobile Networking Lab, Germany
Doreen Böhnstedt, Technische Universität Darmstadt, Germany

16:15
Emergency Communication in Challenged Environments via Unmanned Ground and Aerial Vehicles
Lars Baumgärtner, University of Marburg, Germany
Stefan Kohlbrecher, TU-Darmstadt, Germany
Juliane Euler, Technische Universität Darmstadt & Simulation, Systems Optimization, and Robotics Group, Germany
Tobias Ritter, Technische Universität Darmstadt, Germany
Milan Schmittner, Technische Universität Darmstadt, Germany
Christian Meurisch, TU Darmstadt, Germany
Max Muehlhaeuser, Technical University Darmstadt, Germany
Matthias Hollick, Technische Universität Darmstadt & Secure Mobile Networking Lab, Germany
Oskar von Stryk, Technische Universität Darmstadt, Germany
Bernd Freisleben, Philipps-Universität Marburg, Germany

16:30
Design and Implementation of a Stand-Alone Photovoltaic-Powered Phone booth
Javier Urquizo, Villanova University, USA
Pritpal Singh, Villanova University, USA
Ruben Hidalgo, Escuela Superior Politécnica del Litoral, Ecuador
Pablo Jácome, Universidad de Chile, Chile
Guillermo Soriano, Escuela Superior Politécnica del Litoral, Ecuador

16:45
Exploring Mobile Device Literacy in Senegal
Christelle Scharff, Pace University, USA
Vanessa Rene, Pace University, USA
Jan Gerhard Schoepp, Pace University, USA
Nishit Shah, Pace University, USA
Andrew Greenberg, Pace University, USA
17:00
A Practical and Secure Social Media Facility for Internet-Deprived Populations
Jeremy Lakeman, Flinders University, Australia
Matthew Lloyd, New Zealand Red Cross, New Zealand
Romana Challans, Flinders University of South Australia, Australia
Milan Schmittner, Technische Universität Darmstadt, Germany
Matthias Hollick, Technische Universität Darmstadt & Secure Mobile Networking Lab, Germany
Paul Gardner-Stephen, Flinders University, Australia

17:15
Productizing Humanitarian Telecommunications Research: A Case Study of the Serval Mesh Extender
Paul Gardner-Stephen, Flinders University, Australia
Andrew Bettison, Flinders University, Australia
Romana Challans, Flinders University of South Australia, Australia
Jeremy Lakeman, Flinders University of South Australia, Australia
Patrick Lieser, Technische Universität Darmstadt, Germany
Ralf Steinmetz, Technische Universität Darmstadt, Germany
Flor Alvarez, Technische Universität Darmstadt & Secure Mobile Networking Lab, Germany
Matthew Lloyd, New Zealand Red Cross, New Zealand

17:15- 17:30
Q&A Opportunity

16:00 – 17:30
F4: Education
Room: Monterey
Session Chair: Olga Anderson

16:00 **Remote Presentation
Elevating Education of India’s Rural Village Girls through Distance Learning Technology Supported by Sustainable Electricity
Manoj Pokkiyarath, Amrita Vishwa Vidyapeetham & Amrita University, India
Malini LM Frey, Amrita University, India
Renjith Mohan, Amrita Vishwa Vidyapeetham, India
Vivek Mohan, Amrita Vishwa Vidyapeetham, Amrita University, India
Vidal Conejo-García, Polytechnic University of Catalonia, Spain
Sai Shibu N B, Amrita Vishwa Vidyapeetham, India
Sidhan K, Amrita VishwaVidyapeetham, India

16:15
Case Study: Providing Computer Education at Malawi Children’s Village
Hermona Tamrat, Silman USA
Adrienne White, USA
Sherwyn Hunte, USA

16:30
Free Learning for Humanity
James Schoening, IEEE Learning Technology Standards Committee
Tyde Richards, IEEE Learning Technology Standards Committee, USA
Edilson Arenas, CQUniversity, Australia
Ian Gibson, RePubIT Inc., USA

16:45
Design and evaluation of a low-cost mechatronic system to study upper and lower limbs biomechanics
Heman Lara, Universidad de las Fuerzas Armadas ESPE, Ecuador
Xavier Sánchez, Universidad de las Fuerzas Armadas ESPE, Ecuador
Annabel Paucar, ASEE Member, Ecuador
### 16:55
**Educating IEEE Volunteers to Work on Global Development Projects**  
Pritpal Singh, Villanova University, USA

#### 17:05 – 17:30
Q&A Opportunity

| 16:00 – 17:30 | F5: IEEE Area Meeting  
Room: San Carlos |
|---------------|-------------------|

| 16:00 – 17:30 | F6: IEEE Area Meeting  
Room: San Juan |
|---------------|-------------------|

#### 17:30 – 18:30
**Break | **No Food and Beverage Provided****  
Room: Poolside Foyer

| 18:30 – 21:00 | 2017 GHTC Reception Dinner and IEEE Region 6 Awards  
Room: Sierra/Cascade/Siskiyou |
|---------------|-------------------|
### Sunday, October 22, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
</tr>
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<tbody>
<tr>
<td>07:00 - 18:00</td>
<td>Registration&lt;br&gt;Room: Bayshore Foyer</td>
</tr>
<tr>
<td>10:30 - 11:30</td>
<td><strong>Closing Keynote: Maurizio Vecchione</strong>&lt;br&gt;Room: Sierra/Cascade/Siskiyou</td>
</tr>
</tbody>
</table>

**The Power of Developing World Technology: Reverse Innovation**
Maurizio Vecchione  
*Global Good & Research*

**Abstract:** For many years, the world has approached the developing world as the place where innovation does not happen. The developing world has been a place that receives innovation often as a result of aid or charitable efforts. But no one has a monopoly on innovation. Many times, innovation sprouts from the need and confronting a problem. Increasingly innovation is sprouting to resolve developing world problems that also solve global problems. This has the potential to dramatically address the needs of the base of the pyramid, the potential to move billions out of extreme poverty and to unlock the potential of growth to the global south. This reverse innovation is creating an immense opportunity to innovate at a global scale, with both technology and economic impacts. But what are the approaches, the challenges and the opportunities to global innovation and what are the strategies to tap into this new reverse innovation?

<table>
<thead>
<tr>
<th>Time</th>
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</tr>
</thead>
<tbody>
<tr>
<td>11:30 - 12:00</td>
<td><strong>Closing Remarks: Dick Wilkins, General Chair</strong>&lt;br&gt;Room: Sierra/Cascade/Siskiyou</td>
</tr>
</tbody>
</table>
Sunday, October 22, 2017 | Technical Sessions

08:30 – 10:00
G1: SIGHT Workshop
Moderator:
Tim Lee, IEEE SIGHT Chair
Room: San Jose

Panelists:
Sarang Shaikh, Karachi Section SIGHT, Pakistan
Samar Baba, Tunisia Section SIGHT, Tunisia
Daniel Lottis, Santa Clara Valley Section SIGHT, California, USA
Anis Ben Arfi, Southern Alberta Section SIGHT, Alberta, Canada

08:30 – 10:00
G2: Energy
Room: Santa Clara
Session Chair: Pritpal Singh

08:30
Wind Turbo: Combating the Power Crisis
Chirag Chaudhari, Ohlone College, USA
Huy Nguyen, Ohlone College, USA
Amrit Awasthi, Ohlone College, USA

08:40
Customizable Timing Control Device for Natural Gas Home Appliances to Save Natural Gas
Assad Iqbal, Bahria University Islamabad, Pakistan
Muhammad Khan, Bahria University Islamabad, Pakistan

8:50
Sustainable Electric Power Impact on Rural Congo Villages
Nicholas Powers, ABB Inc. USA, USA

09:00
DC Micro-Grid Pricing and Market Model
Zacakry Minshew, Georgia Southern University, USA
Adel El Shahat, Georgia Soothern University, USA

09:10
Battery-Degradation Model Based On The ANN Regression Function for EV Applications
Gabrielle May, Georgia Southern University, USA
Adel El Shahat, Georgia Soothern University, USA

09:20
Proton Exchange Membrane Fuel Cell Modeling
Samuel Fakorede, Georgia Southern University, USA
Adel El Shahat, Georgia Soothern University, USA

09:30 – 10:00
Q&A Opportunity
08:30 – 10:00
G3: Communications
Room: Carmel
Session Chair:

08:30
Defining Success in a Developing Country’s Innovation Ecosystem: the case of Rwanda
Eric Obeysekare, Pennsylvania State University, USA
Khanjan Mehta, Lehigh University, USA
Carleen Maitland, The Pennsylvania State University USA, USA

08:45
Optimising the Question Box for Cost and Local-Manufacturability
Rose Shuman, Open Mind, USA
Jooyoung Kim, Flinders University, Australia
Paul Gardner-Stephen, Flinders University, Australia

09:00
UMEDAnet: A UAV-based Mobile Environmental Data Collection Network
Farid Farahmand, Sonoma State University, USA

09:10
Ambulance Alert Application for Emergency Management
Assad Iqbal, Bahria University Islamabad, Pakistan
Jawad Rauf, Bahria University Islamabad, Pakistan
Junaid Khalid, Bahria University Islamabad, Pakistan

09:25 – 10:00
Q&A Opportunity

08:30 – 10:00
G4: Education
Room: Monterey
Session Chair: Olga Anderson

08:30
Implementation of a Global Humanitarian Outreach Experience by Partnering Engineering, Business, and High-Tech Nursing Education with Non-Governmental Organizations
Victoria Carlson-Oehlers, Milwaukee School of Engineering, USA
Patrick Jung, MSOE University, USA
Bernard Cohen, MSOE University & Neurological Monitoring Associates, LLC, USA

08:45
Brian Tomaszewski, Rochester Institute of Technology, USA
Jean-Laurent Martin, United Nations High Commissioner for Refugees, Jordan
Irene Omondi, United Nations High Commissioner for Refugees, Jordan
Nijad Al-Najdawi, Al-Balqa Applied University, Jordan
Sara Tedmori, Princess Sumaya University For Technology, Jordan
Yusef Hamad, Za’atari Refugee Camp, Jordan

09:00
Including Non-Engineering Students in an International Service-Learning Engineering Project - A Case Study
Kenneth Wai Kwan Lo, The Hong Kong Polytechnic University, Hong Kong
Chi Kin Lau, The Hong Kong Polytechnic University, Hong Kong
Stephen Chi Fai Chan, The Hong Kong Polytechnic University, Hong Kong
Grace Ngai, The Hong Kong Polytechnic University, Hong Kong
09:15
Adoption of Quality Culture - A case study of Mehran University of Engineering & Technology, Jamshoro, Sindh, Pakistan
Asif Ali Shah, Mehran University of Engineering & Technology Jamshoro, Sindh, Pakistan
Muhammad Aslam Uqaili, Mehran University of Engineering & Technology (MUET) Jamshoro, Pakistan
Abdul Sami Qureshi, Mehran University of Engineering & Technology (MUET) Jamshoro, Pakistan

09:30
From First- to Third-Order Social Change in Development Engineering: A Case Study
Brandon Reynante, University of California, San Diego, USA
Mandy Bratton, University of California, San Diego, USA
Lin Hein, University of California, San Diego, USA

09:45 – 10:00
Q&A Opportunity

08:30 – 09:15
G5a: Panel: An Initial Assessment of the Peugeot Center’s Completed Projects and a Look Forward to the Future
Room: San Carlos
Session Chair: Coming Soon

08:30 – 09:15
Panel: An Initial Assessment of the Peugeot Center’s Completed Projects and a Look Forward to the Future
Kirsten Dodson, Lipscomb University, USA
Kerry Patterson, The Peugeot Center, USA
Kevin Colvett, CH2M Hill, USA
Kris Hatchell, Barge, Waggoner, Sumner, Cannon, USA

09:15 – 10:00
G5b: Panel: IEEE WIE and Humanitarian Technologies
Room: San Carlos
Moderator: Celia Shanaz

09:15
Inspiring more engagement of women in humanitarian technology based projects at local communities
Bozenna Pasik-Duncan, IEEE WIE CHAIR 2017
Katheleen Kramer, IEEE R6 Director
Joan Kerr, Chair, IEEE Smart village Project, Sustainable Agriculture working group
Silvia Figueria, Santa Clara University

10:00 – 10:30
Break
Room: Sierra/Cascade/Siskiyou
Hotel Floor Layout
GHTC 2018
IEEE Global Humanitarian Technology Conference
DoubleTree By Hilton San Jose, California, USA — October 18-21, 2018
Organized by IEEE Region 6 & IEEE Santa Clara Valley Section

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