IEEE GHTC 2024

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14th IEEE Global Humanitarian Technology Conference

October 23-26, 2024 | Villanova University, Pennsylvania USA

VILLANOVA
U N I V E R S I T Y

October 23rd-25th,2024
Villanova Inn, PA, USA

PROGRAM GUIDE

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WELCOMES
Welcome from the Conference Chair

It is my pleasure to welcome you to the 2024 IEEE Global Humanitarian Technology Conference (GHTC). GHTC is the flagship annual conference that brings together academics, for-profit and non-profit organizations, field practitioners, and students to demonstrate how they are addressing the UN Sustainable Development Goals using technology to meet the needs of under-served communities around the world.

The conference program includes two pre- conference workshops titled "Effective AI for Social Good" and "Humanitarian Engineering Education Programs". I am sure that you will find both workshops very interesting.

We have several keynote speakers, plenary sessions, panels, and presentations by colleagues from all over the world. The opening day plenary session will include three speakers: Mr. Amit Bhatnagar, founder of Accuster Technologies Pvt. Ltd, a company now addressing healthcare problems in India and across the world, Mr. Andrew Lamb, Chair, Internet Production Alliance working on distributed manufacturing worldwide, and Ben Savonen, has been working for 13 years in global development and social entrepreneurship in the US and East Africa. We have panels on Young Professionals/Women in Engineering, and the IEEE Humanitarian organizations, including IEEE HTB, IEEE Smart Village, and IEEE EPICS. The keynote speaker at the Conference Gala Dinner is Dr. Revi Sterling, Technical Director, Women in the Digital Ecosystem Fund (WiDEF), where her work focuses on bringing connectivity and digital literacy to women across the world.

We are delighted and honored to again host this 14th edition of the conference at Villanova University. Located about 12 miles west of Philadelphia, Villanova University is conveniently located about a 20-minute train ride from the City of Philadelphia and about 30 minutes' drive from Philadelphia International Airport. The City of Philadelphia offers many cultural experiences including excellent restaurants, the famous Philadelphia Museum of Art, where you can take a picture of the Rocky statue. Philadelphia was the first capital of the United States and is where Independence Hall (where the US Constitution and the Declaration of Independence were written) and the Liberty Bell are located. South Philadelphia is also the home of several prominent sporting teams including the Phillies baseball team, the Eagles football team, the Flyers ice hockey team, the 76ers basketball team, and the Union MLS soccer team. The famous King of Prussia Mall, the second largest mall in the US, and Valley Forge National Park, are also located close to Villanova University.

I want to thank everyone who has made this year's IEEE GHTC conference possible, including:
- Members of the Technical Committee
- Track chairs
- Session chairs
- Logistics and local arrangements coordinators
- Publicity chair
- Publications chair
- Authors of papers and posters

I also want to thank the financial sponsors and patrons who have supported this year's conference.

We are grateful that you have taken the time to attend the conference in person or remotely. We hope that you will engage with your colleagues, learn from each other, forge new partnerships, and take advantage of the many social opportunities offered by Philadelphia and its surrounding areas.

Best wishes for a fruitful and enjoyable 2024 IEEE Global Humanitarian Technology Conference!

Dr. Pritpal ("Pali") Singh
Chair, 2024 IEEE Global Humanitarian Technology Conference

Welcome from the Technical Program Chairs

Welcome to the *14th Annual IEEE Global Humanitarian Technology Conference (GHTC)* in Philadelphia. GHTC brings together researchers and practitioners to share practical technology-enabled solutions that address the needs of underserved populations worldwide.

The response to the call for papers was very positive. We received a total of 159 submissions of full papers and oral-only presentations that represented a wide variety of projects at various stages of maturity. Of these, 80 have been accepted, resulting in an array of exciting presentations from 16 countries that broadly cover the UN Sustainable Goals underlying the conference. We personally read every paper and are confident that all attendees will leave the conference inspired to create more impact. This year, presentations are spread across 16 technical sessions in two days, our two-track format with considerable question time will allow attendees to see more of the papers and have substantial interactions with presenters.

After last year's very positive feedback on the new program format, we are reducing the technical sessions to five presentations each (eight minutes for each presentation followed 35 minutes for discussion with and among all presenters) to promote greater discussion and future collaborations. These presentations are complemented by an array of keynotes, plenary presentations, and panel discussions on a variety of topics.

Following last year's success, the conference once again commences with the GHTC *Souk*, a marketplace for everyone to present and share impactful ideas whether they are just a notion, or something fully implemented. Every attendee, whether they have a paper or not is encouraged and expected to bring something to share – a product, a poster, photos, or an idea on a napkin. We know everyone will find ideas, collaborators, and connections in a fun-filled and informal atmosphere.

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. We would also like to thank the entire conference planning committee for their invaluable leadership and patience with the two program chairs during the planning of the conference. Everyone's hard work and dedication to creating the best possible event should have all attendees excited.

We welcome you to Philadelphia, look forward to meeting you in person, and hope that you 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.

Toby Cumberbatch and John Gershenson

IEEE GHTC 2024 Technical Program Committee Chairs

CONFERENCE COMMITTEES

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IEEE Foundation	engageSPARK — Survey & message hard-to-reach populations — at scale
As the philanthropic partner of IEEE, the IEEE Foundation translates the values of our members and donors into social impact. We connect 270+ IEEE member-led initiatives with financing, expertise and philanthropic guidance. Our goal is to put effort where philanthropy and technology intersect. Together, we deliver opportunity, innovation and impact, and advance the IEEE mission across the globe. https://www.ieeefoundation.org/	engageSPARK is a tech social enterprise that helps academic researchers and humanitarian organizations survey and message hard-to-reach populations in low- and middle-income countries (LMICs), typically participants who do not have internet access but have basic mobile phones (non-smartphones). https://www.engagespark.com/

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IEEE★USA 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.	IEEE SA STANDARDS ASSOCIATION 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.	

VENUE

The 14th IEEE Global Humanitarian Technology Conference (IEEE GHTC 2024) will take place from October 23rd to October 25th, 2024, in person in Villanova, Pennsylvania, USA at the **Inn at Villanova University**, Rooms (#114,115,119 and Ballroom).

The Inn at Villanova is high-end conference hotel is 2 miles from Villanova University and 3 miles from Chanticleer Garden. It's a minutes' walk from a tram station. The main entrance is located at 601 County Line Rd, Wayne, PA 19087.
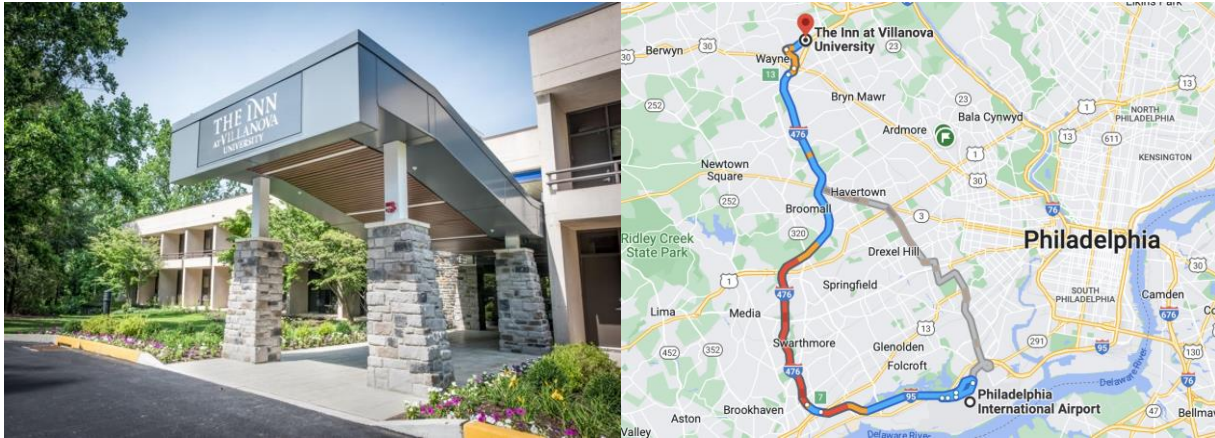

See the Inn at Villanova University Website (https://theinnatvillanova.com | https://theinnatvillanova.com/about-us/our-location)

The Inn at Villanova is in a safe and suburban area of Villanova. It is less than 2 miles from Villanova's campus, and 18 miles from Philadelphia City. The Inn at Villanova is within 22.3 miles through I-46N, 18.7 miles through PA-3 W/West Chester Pike & I-46N, and 24.5 miles though I-46 W.

Rooms

GHTC is using the following rooms:

- Level 1: 114, 115, and 119
- Level 3: Ballroom

Level 1: Rooms 114, 115, and 119

Level 3: Ballroom
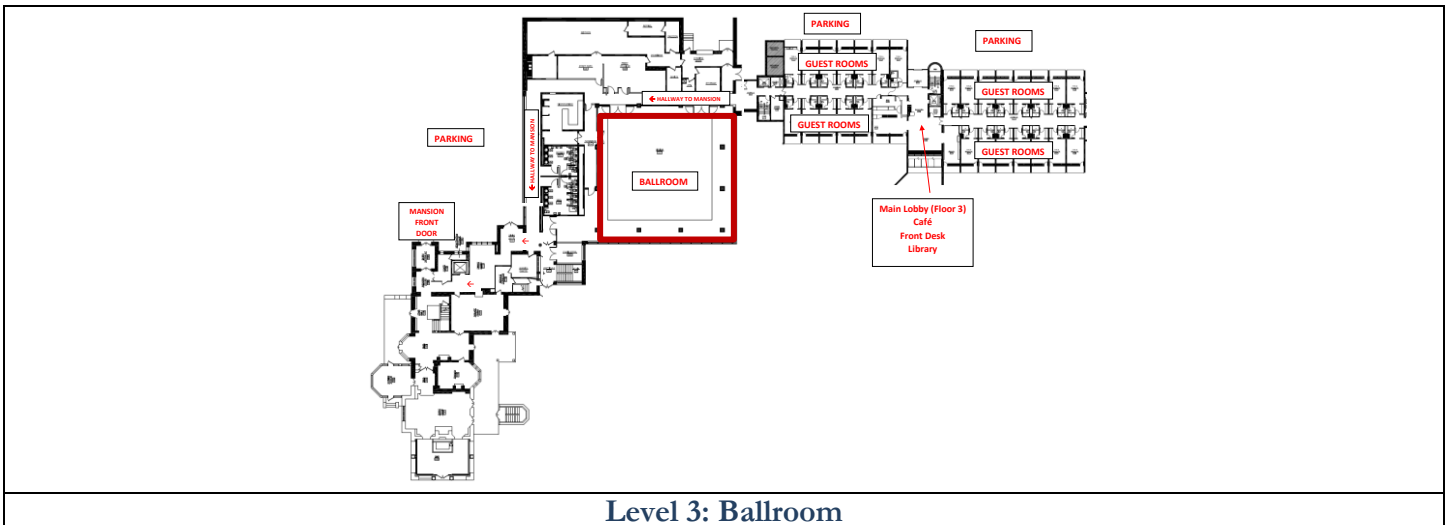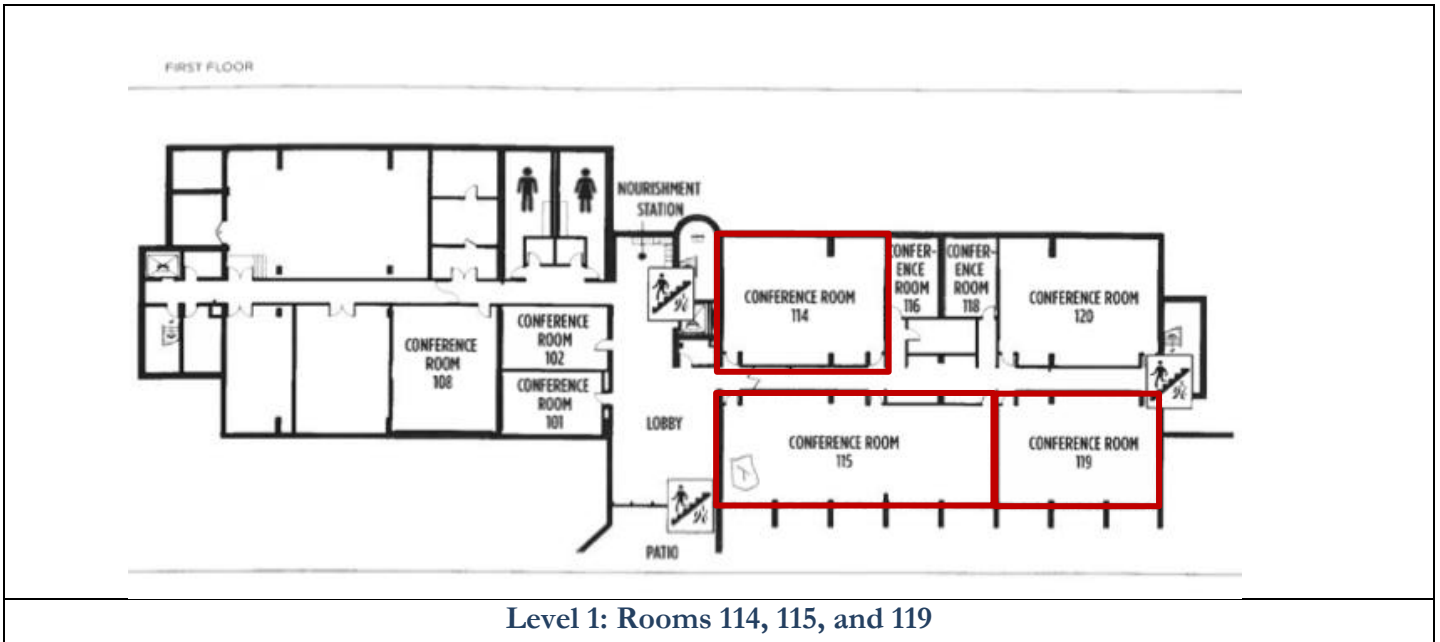
SCHEDULE

GHTC 2024 Program Schedule

Wednesday, 23-Oct-24 (Pre-conference)		
1300-1445 (Room 119)	**Workshop: Effective AI for Social Good**	
1500-1645 (Room 119)	**Workshop: Humanitarian Engineering Education Programs**	
1700 – 2100 (in ballroom)	**Welcome: Evening souk (marketplace/bazaar) with light food and cash bar**	
Thursday, 24-Oct-24 (Conference Day 1)		
0800-0830	**Opening remarks with Breakfast**	
0830 – 1020 (in ballroom)	**Panel: Technology Development to Technology Implementation Panel** **Panelists:** Andrew Lamb, Amit Bhatnagar and Ben Savonen	
1030 – 1150	**Session 1A** (Room 115)	**Session 1B** (Room 119)
1150 – 1210 (1st floor)	**Break:** Time to interact with speakers and catch up with old friends	
1210 – 1330	**Session 2A** (Room 115)	**Session 2B** (Room 119)
1340 – 1520 (in ballroom)	**Lunch** **Panel: Engineering with purpose: The New Humanitarian Technologies Approach** **Panelists:** Stephanie Gillespie, Sampath Veeraraghavan, Toby Cumberbatch	
1530 – 1650	**Session 3A** (Room 115)	**Session 3B** (Room 119
1650 – 1710 (1st floor)	**Break:** Time to interact with speakers and catch up with old friends	
1710 – 1830	**Session 4A** (Room 115)	**Session 4B** (Room 119
1850 – 2200 (ballroom)	**Conference Dinner** **Speaker:** Dr. Revi Sterling, Technical Director, Women in the Digital Ecosystem Fund (WiDEF)	
Friday, 25-Oct-24 (Conference Day 2)		
0800-0830	**Breakfast with Networking**	
0830 – 1020 (in ballroom)	**Women in Humanitarian Technology Panel** **Panelists:** Heather Beem, Amina Abubakar, Sophia Haoui	
1030 – 1150	**Session 5A** (Room 115)	**Session 5B** (Room 119)
1150 – 1210 (1st floor)	**Break:** Time to interact with speakers and say hello to old friends.	
1210 – 1330	**Session 6A** (Room 115)	**Session 6B** (Room 119)
1340 – 1520 (in ballroom)	**Lunch & Updates** **Speaker:** Avner Mizrahi, engageSPARK	
1530 – 1650	**Session 7A** (Room 115)	**Session 7B** (Room 119)
1650 – 1710 (1st floor)	**Break:** Time to interact with speakers and say hello to old friends.	
1710 – 1830	**Session 8A** (Room 115)	**Session 8B** (Room 119)
1830 – offsite	Dinner on own with new friends	

WORKSHOPS

GHTC 2024 Features Two Pre-Conference Workshops on October 23 from 1:00-5:00 pm

- [Effective AI for Social Good](#), presented by Global Health Labs
- [Humanitarian Engineering Education Programs](#)

Effective AI for Social Good
Date: October 23, 1300 - 1445
Room 119 (1st floor)

Presenters:

- Ishan Shah, Research Engineer, AI group at Global Health Labs.
- Charles Delahunt, Senior Research Engineer, AI group at Global Health Labs.

Abstract:

AI methods have greatly increased in power and maturity in recent years, and if applied correctly they can have tremendous impact for good in areas such as health care in low resource settings. But AI solutions, however well-intentioned, are guaranteed to fail if they are mismatched to the needs of the targeted use case. Therefore, as a necessary condition of success, we must fully understand the constraints and needs of the use case, and we must design these elements into the AI development process at every step.

In this workshop, we will describe this design process, aided by concrete examples from our work on AI for global health. Attendees will bring away core principles and specific techniques to enable design of AI for successful deployment and impact.

Agenda:

Tutorial (2 hours):

1. Introduction and context
2. Short talks (~20 minutes + Q-A) highlighting particular topics, with examples from global health projects. Topics:
   a. The promise and obstacles for AI in global health
   b. Understanding the deployment ecosystem
   c. Centering the use-case and performance requirements
   d. Tailoring ML evaluation metrics and loss functions to the use-case
   e. Data: collecting, annotating, and cleaning
   f. The central role of domain experts and field partners
3. Discussion, further resources, closing remarks

Outcomes:

Attendees will bring away core principles and specific techniques to enable design of AI for successful deployment and impact. While the examples are drawn from global health, the principles apply broadly to any AI use-case.

Presenter Bios:

	Ishan Shah joined the AI team at GH Labs in 2021 as a Research Engineer and has primarily worked on the development and analysis of visual deep learning models to detect cervical precancer in low-resource settings. Previously, he completed his Master's degree in data science from Stanford University and helped build deep learning algorithms for digital pathology slides at pharmaceutical company Roche.
	Charles Delahunt is a Senior Research Engineer on the AI team at GH Labs and has applied AI to global health challenges for over 10 years. He has also held a postdoc researching ML methods at University of Washington's applied math department. He serves on the scientific committee of the American Society of Tropical Medicine and Hygiene; has advised the WHO on digital microscopy for malaria; and serves on the board of RISE-MICCAI, which works to increase participation of LMIC-based researchers in the AI community.
	Global Health Labs, Inc (GH Labs) innovates to reduce health disparities, especially in low- and middle-income countries. As a nonprofit corporation fully funded by Gates Ventures (the private office of Bill Gates), GH Labs partners with the Gates Foundation and other cross-sector leaders to develop health technology solutions for the people who need them most.

Humanitarian Engineering Education Programs
Date: October 23, 1500 - 1645
Room 119 (1st floor)

Presenters:

- Kevin Moore, Executive Director, Humanitarian Engineering Program, Colorado School of Mines
- Lin Yong, Chair, Humanitarian Engineering Minor, Miami University School of Engineering
- Brian Thomas, Senior Lecturer in Electrical and Computer Engineering, Baylor University

Abstract:

This panel session and participatory workshop addresses the organization and content of Humanitarian Engineering (HE) educational programs, with the primary goal of identifying the frameworks, body of knowledge and current practices commonly found in such programs. We hope to conclude the session with some agreement on a standardized subset of knowledge that would be expected to be found in a course or program titled "Humanitarian Engineering" or similar. A second goal is to develop a network of educators in this space who can exchange ideas and best practices.
In the session selected panelists will frame questions for audience members to address individually and in groups, in a workshop format. Session activities will identify the essential (and hopefully

common) body of knowledge in HE programs in two broad areas: 1) foundational conceptual knowledge that motivates and informs HE programs and 2) specific topics that should be included in these programs. Throughout, collaborative online data collection tools will be used, so participants will need to have a mobile device.

Organizers/Presenters:

	Kevin Moore, Colorado School of Mines: Kevin Moore is the Executive Director of the Humanitarian Engineering Program at the Colorado School of Mines (Mines), where he is a Professor in the Department of Engineering, Design, and Society and in the Department of Electrical Engineering. He has held faculty and leadership positions at multiple universities and has significant industry and consulting experience. He interests include control systems, robotics, and their applications, senior design pedagogy, accreditation and curriculum design, and humanitarian engineering.
	Lin Yong, Miami University: Dr. Lin is a faculty member and Chair of the Humanitarian Engineering Minor at Miami University's School of Engineering, where he focuses on integrating humanitarian principles into engineering solutions to tackle critical global challenges. As a co-founder of GrowChild.org, a nonprofit organization, he leads efforts to address two pressing issues: converting e-waste, specifically landfilled computers, into educational tools to mitigate environmental impact, and providing low-income families with essential resources to help children escape poverty through education. With over 20 years of industry experience at Fortune 500 companies, Dr. Lin brings a wealth of expertise to his role. He has also made significant contributions to public service, serving as an advisory board member for the Ohio State government's Minority Development Financing Advisory Board since 2013.
	Brian Thomas, Baylor University: Brian Thomas, Baylor University: Brian is a Senior Lecturer in Electrical and Computer Engineering and is the Faculty-in-Residence at the Gordon Teal Residential College at Baylor. He is a leader of Baylor's efforts in humanitarian engineering, both in curricular development and teaching. He has held positions in academia and industry and is a founder of a nonprofit organization focused on energy access. At Baylor he has taught a wide range of courses, including ethics, technologies for development, renewable energy, and design. He has also led many international humanitarian engineering projects.

PLENARY SPEAKERS

Conference Dinner

6:50 – 10:00pm Thursday, 24-Oct-24

Dr. Revi Sterling, Technical Director, Women in the Digital Ecosystem Fund (WiDEF)

Dr. Revi Sterling has worked to advance digital inclusion in both domestic and international contexts for over 25 years. She is the Technical Director for the Women in the Digital Ecosystem Fund (WiDEF), a White House initiative to close the gender and technology gap. She previously developed and ran the USAID Women Connect Challenge, another presidential program that successfully spanned three administrations.

Prior to these positions, Revi founded and directed the first ICT for Development professional master's program in the United States at the University of Colorado Boulder, where she also did her PhD in Technology, Media, and Society. Before academia, Revi spent a decade at Microsoft Research spearheading efforts in gender equity in computer science, and in the Emerging Technologies division as a software engineer and program manager.

She serves on leading gender and technology boards, has testified before the U.S. Congress about emerging technologies, and has received such awards as the Anita Borg Institute's Social Impact Award and Engineering4Change's Women Technologist of the Year. She is passionate about rural connectivity, community readiness for technology, and everything related to digital equity.

Friday Lunch Speaker

1420 – 1520 Friday, October 25th

Avner Mizrahi, CEO of engageSPARK

"Robocalls" is a dirty word – but should it be? A deep dive into Robocalls for Research and Impact in Low- and Middle-Income Countries

Abstract:

I will discuss largescale remote data collection in low- and middle-income countries (LMICs) with a particular focus on how robocalls – which everyone generally hates – are actually a critical component of international development and humanitarian research in LMICs.

I will walk through some "robocalls for development" case studies from across the globe, including work done by Johns Hopkins School of Public Health professors. I will discuss how generative AI is allowing for even more robust data collection from offline and illiterate populations. And I'll do a brief demo of the engageSPARK platform to give attendees a feel for how they could create a robocall (IVR) survey for humanitarian research and launch it anywhere in the world.

Bio:

Avner Mizrahi is the CEO of engageSPARK, a social enterprise that helps university researchers, international development organizations, and social enterprises collect data from hard-to-reach populations in low- and middle-income countries (LMICs) – remotely and at scale. engageSPARK has supported academic research and other humanitarian projects in 185+ countries run by professors at Johns Hopkins, Harvard, Columbia, Yale, and many other research universities, as well as by hundreds of NGOs and UN agencies.

Before engageSPARK, Avner practiced law, first as a corporate litigator, then as a human rights lawyer. He led one of the largest and first insurance cases to come out of the 2008 credit crisis and then spent several years in Uganda fighting for the rights of vulnerable and marginalized individuals. While in Uganda, Avner co-founded the anti-corruption organization Not In My Country and then co-founded engageSPARK. Avner has a JD from New York University School of Law and a BA in International Studies from Johns Hopkins University.

PANELS

Thursday, 24-Oct-24, 2024 0830-1020	Technology Development to Technology Implementation
Thursday, 24-Oct-24, 2024 Lunch	Engineering with purpose: The New Humanitarian Technologies Approach
Friday, 25-Oct-24, 2024 0830-1020	Women in Humanitarian Technology Panel

Technology Development to Technology Implementation
Thursday, 24-Oct-24, 2024
0830-1020

In this kickoff keynote panel we set the stage for this conference and its theme - DOING. Three panelists, with extensive experience in engineering with communities, will give brief introductory remarks on their background and their view of the distance between technology development and technology implementation in their fields. Then, with the aid of a moderator, we will further explore challenges and opportunities in bridging development and implementation.

Panelists:

- Andrew Lamb, Internet of Production Alliance
- Amit Bhatnagar, founder and CEO of https://accuster.com/
- Ben Savonen, Global Development Incubator

Moderators:

- John Gershenson, Director, Humanitarian Engineering and Social Entrepreneurship program, Penn State University
- Toby Cumberbatch, Cooper Union

Panelist Bios:

Andrew Lamb (MEng, MA, MIET, FRSA) graduated in 2005 from the University of Cambridge with a Masters degree in Electronics, Information & Systems Engineering and has worked in international development aid and humanitarian disaster relief for 20 years, with a particular focus in the East Africa, South Asia and the Pacific regions.

Andrew's key roles include growing the international humanitarian innovation organisation Field Readyas its Global Innovation Lead (2012-2022) where he worked on distributed manufacturing and its role in humanitarian relief, and with Engineers Without Borders UK (2002-2013) in senior positions including as its first Chief Executive (2008-2013) where he worked on decentralised technologies in poverty reduction contexts. Andrew is regarded as one of the world's leading experts in distributed manufacturing in the Global South, in scaling humanitarian innovations and in global engineering and technology capacity building.

Andrew's current roles are as the Chair of the Internet of Production Alliance (which is developing open infrastructures for scaling distributed manufacturing,

with particular emphasis on the Global South), as co-founder of the Local Procurement Learning Partnership (hosted by the Humanitarian Logistics Association, this partnership helps relief and development agencies to buy locally made products) and as the Director of his company Massive Small Manufacturing Ltd (which focuses on scaling small-scale plastic recycling in the Global South and accelerating the scaling of humanitarian hardware products). He is also on the board of the Appropedia Foundation, Helpful Engineering and FabLab Winam (the makerspace in Kisumu, Kenya). He is on the Supervisory board of the Global Innovation Gathering and the board of Mekanika, an open-hardware machine manufacturer.

Amit Bhatnagar, an IITian turned social entrepreneur and the founder of Accuster Technologies Pvt. Ltd., New Delhi, spent 3.5 years in the USA for education and work. Realizing the importance of serving his nation and contributing to its development, he decided to return to India in 2008

As a technocrat, he identified a mission to give back to society, recognizing that the most prevalent problem in Indian society was the lack of proper diagnostics and limited availability of preventive healthcare services. He initiated his journey with a small setup in a single room, alongside a dedicated team, and developed it into a manufacturing plant with around 50 people by the year 2011. Under the guidance and leadership of Mr. Amit Bhatnagar, Accuster Technologies Pvt. Ltd. is now addressing healthcare problems not only in India but also across the world.

Amit has a S. Bio-engineering, PennState, and B Tech. Mechanical Engineering, IIT Roorkee.

Ben Savonen has over 13 years of experience working in global development, technology, and entrepreneurship. Starting his career as a Peace Corps volunteer in Tanzania, Ben has since had the opportunity to collaborate with dozens of NGOs and social enterprises in both the US and East Africa. He has worked as a strategy and technology adviser to the World Bank, UNDP, FEMA, Field Ready, Villgro Africa and Penn State. He is at the Global Development Incubator where he is both a Manager on the strategy and build team and the Director of Innovation at Tabiya. He is most notably the cofounder of the Kenya-based start up Kijenzi, which develops local manufacturing solutions to critical supply gaps experienced in lower- and middle-income communities.

An engineer by training and an entrepreneur by experience, Ben is passionate about finding innovative solutions to real human needs. He holds degrees in mechanical and environmental engineering from Ohio State (BS), Michigan Tech (MS), and Penn State (Ph.D.).

Panel: Engineering with purpose: The New Humanitarian Technologies Approach
Thursday, 24-Oct-24, 2024
Lunchtime (2:10-3:20 PM)

Description:

Engineering with Purpose: The New Humanitarian Technologies Approach is a high level session that will explore the role of HTB in creating the infrastructure and mechanisms to apply technology to address global challenges. This panel will bring together leading volunteers from the different IEEE Humanitarian Technology consortium of programs as well as experts to discuss how IEEE programs are working together to harness the power of technology for good.

Additionally, this session highlights outcomes of HTB-supported research on best practices in the humanitarian technologies world, and the user journey study conducted to understand the motivations, barriers, and career impacts experienced by IEEE members and volunteers engaged in HT programs. The new approach that HT is proposing is based on evidence-based research and proposes a more comprehensive support for more sustainable, ethical, and inclusive technological practices that drive socio-economic development and sustainability. Attendees will gain insights into the offerings and future of the Humanitarian Technologies at IEEE and how to engage more actively.

Moderator: Julianna M. Pichardo, IEEE Humanitarian Activities & Sustainable Development Manager

Panelists:

- Stephanie Gillespie, EPICS in IEEE Committee Chair
- Sampath Veeraraghavan, IEEE Humanitarian Technologies Board (HTB), with focus on Tech4Good
- Toby Cumberbatch, IEEE Smart Village (ISV)

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

EPICS stands for **Engineering Projects in Community Service**. The program was founded in 1995 at Purdue University. It was created to meet a two-fold challenge: providing community service organizations with technology they need to improve and deliver services, and providing undergraduate students with educational experiences to broaden their skills.

The program has now spread to universities throughout the United States and abroad, as well several K-12 programs. EPICS in IEEE was founded in 2009 and has facilitated more than 180 projects in over 30 countries and has impacted more than 1,500,000 people through our university initiative and K-12 initiative.

Dr. Stephanie Gillespie is the 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.

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.

Prof. Toby Cumberbatch is a professor emeritus of electrical engineering at The Cooper Union in New York City where he taught from 1994 to 2018. His principal research interests are developing engineering practices to address the needs of impoverished, marginalized communities through Engineering for the Middle of Nowhere.

In 2003 he took his first group of students to a village in West Africa where he had lived as a child. From these trips and other classes emerged SociaLite Lighting Systems, a small 501c3 that manufactures and installs lighting systems and micro-grids for communities in regions without infrastructure. Dr. Cumberbatch continues to develop these systems and support SociaLite's operations in Ghana and beyond.

Women in Humanitarian Technology Panel
Friday, 24-Oct-24, 2024
0830-1020

Panelists:

- Dr. Heather Beem, Professor of Engineering, Ashesi University
- Ms. Amina Abubakar, Founder and Chief Consultant, Adaptive Solutions Africa Ltd
- Ms. Sophia Haoui, Software Developer, New Sun Road

Panelist Bios:

Heather Beem is a Scholar-Practitioner, studying hands-on education in the classroom and scaling best practices in the field. Heather completed her PhD in Mechanical Engineering at the Massachusetts Institute of Technology in 2015. While a graduate student, Heather developed a vision for seeing MIT-style hands-on learning environments manifest around the globe. She became active in the MIT D-Lab, where she co-founded the D-Lab: Education (https://d-lab.mit.edu/courses/education) class, mentoring dozens of students in projects spanning four continents.

In 2016, Heather moved to Ghana, where she founded and leads Practical Education Network (PEN) (https://www.practicaleducationnetwork.com) in the training of thousands of African STEM teachers to deploy experiential pedagogies. In that process, she has developed partnerships with several stakeholders in the education ecosystem, infused low-cost, hands-on STEM content into the national curricula, built a strong local team, and tested models for scaling the impact. Heather has served on the engineering faculty since 2018, helping build Ashesi's Mechanical Engineering program.

She leads the Ashesi Resourceful Engineering Lab (AREL), which explores the mechanisms and manifestations of indigenous innovation, particularly in fluid mechanics, renewable energy, and experiential education.

Amina Abubakar is an education and development expert with more than 8 years' experience in providing access to qualitative and inclusive education, and education policy reforms. Through the FlexiSAF Foundation, her work has directly supported more than 5000 children and millions more indirectly through policy advocacy.

She is a Mandela Washington Fellow, a flagship program of the US State Department recognizing Young African Leaders. Amina is also part of the Goalkeepers Network of the Gates Foundation and in 2023 was named among the top 25 young Africans making a sustainable impact in the African education landscape.

As Founder and Chief Consultant at Adaptive Solutions Africa Ltd, Amina is helping local NGOs strengthen their organizational systems and amplify their impact, so reaching more people in need and making the world a better place. Amina's works have been featured on national and international media including NTA international, the Voice of America and other well-known platforms.

Sophia Haoui is a Software Engineer with extensive experience in developing mobile applications for connected vehicles, including buses and trucks. Sophia has also worked as a consultant on machine learning software for hospitals and as a Software Development Engineer in Test at Autodesk. Sophia's background includes a Bachelor's degree in Computer Science from the University of Michigan. New Sun Road is a public benefit corporation developing data-driven IoT technology solutions.

PROGRAM SESSIONS

GHTC 2024 Program Sessions

Time (New York)	Ballroom	Room 115	Room 119
13:00-14:45		WKSP1: *Effective AI for Social Good*	
15:00-16:45		WKSP2: *Humanitarian Engineering Education Programs*	
18:00-21:00	SOUK: *Evening souk*		
08:00-08:30	THBK: *Breakfast*		
08:30-09:00	OPN: *Opening Remarks*		
09:00-10:20	PNL1: *Technology Development to Technology Implementation*		
10:30-11:00		1A: *AI in Education*	1B: *Climate Change Data*
11:00-11:50			
12:10-13:30		2A: *Productivity Solutions in Agriculture*	2B: *Information for Entrepreneurship*
13:40-14:10	THLU: *Lunch*		
14:10-15:20	HPNL: *IEEE Humanitarian Technology Panel*		
15:30-16:50		3A: *Power Grid Solutions*	3B: *Technology for Education*
17:10-18:30		4A: *Diet, Nutrition and Oral Health*	4B: *Human-Machine Interface*
18:50-22:00	BANQ: *Conference Dinner*		
08:00-08:30	FBK: *Breakfast*		
08:30-10:20	FPNL: *Women in Humanitarian Technology Panel*		
10:30-11:00		5A: *AI in Agriculture*	5B: *Entrepreneurship for All*
11:00-11:50			
12:10-13:30		6A: *Technology for Community Well Being*	6B: *The Economics of Sustainability*
13:40-14:10	FLU: *Lunch*		
14:10-15:20	PLEN: *Keynote: Avner Mizrahi, engageSPARK*		
15:30-16:50		7A: *Technology Development*	7B: *Emergency Response Technologies*
17:10-18:30		8A: *Technology for Well Being*	8B: *Aid, Assistance and The Digital Divide*
18:50-21:30			

Wednesday, October 23, 2024

Wednesday, October 23 13:00 - 14:45 (America/New_York)
WKSP1: Effective AI for Social Good
Room 115

Presenters:
- Ishan Shah, Research Engineer, AI group at Global Health Labs.
- Charles Delahunt, Senior Research Engineer, AI group at Global Health Labs.

AI methods have greatly increased in power and maturity in recent years, and if applied correctly they can have tremendous impact for good in areas such as health care in low resource settings. But AI solutions, however well-intentioned, are guaranteed to fail if they are mismatched to the needs of the targeted use case. Therefore, as a necessary condition of success, we must fully understand the constraints and needs of the use case, and we must design these elements into the AI development process at every step.

In this workshop, we will describe this design process, aided by concrete examples from our work on AI for global health. Attendees will bring away core principles and specific techniques to enable design of AI for successful deployment and impact.

Wednesday, October 23 15:00 - 16:45 (America/New_York)
WKSP2: Humanitarian Engineering Education Programs
Room 115

Presenters:
- Kevin Moore, Executive Director, Humanitarian Engineering Program, Colorado School of Mines
- Lin Yong, Chair, Humanitarian Engineering Minor, Miami University School of Engineering
- Brian Thomas, Senior Lecturer in Electrical and Computer Engineering, Baylor University

This panel session and participatory workshop addresses the organization and content of Humanitarian Engineering (HE) educational programs, with the primary goal of identifying the frameworks, body of knowledge and current practices commonly found in such programs. We hope to conclude the session with some agreement on a standardized subset of knowledge that would be expected to be found in a course or program titled "Humanitarian Engineering" or similar. A second goal is to develop a network of educators in this space who can exchange ideas and best practices.

Wednesday, October 23 18:00 - 21:00 (America/New_York)
SOUK: Evening souk
Room: Ballroom

Designed as a universal marketplace for easy exchange of ideas and introductions to fellow conference participants, ALL ATTENDEES are urged/encouraged to arrive with material to post. We will provide the means for you to display whatever you provide-be it a "formal" poster to sheets of paper. Material posted will remain displayed for the duration of the conference to provide easy access to attendee's interests.

Everyone is encouraged to participate whether you plan your poster ahead of time, or put it together when you arrive.

Thursday, October 24

Thursday, October 24 8:00 - 11:00 (America/New_York)

THREG: Registration
Room: Foyer

Thursday, October 24 8:00 - 8:30 (America/New_York)

THBK: Breakfast
Room: Ballroom

Thursday, October 24 8:30 - 9:00 (America/New_York)

OPN: Opening Remarks
Room: Ballroom

Thursday, October 24 9:00 - 10:20 (America/New_York)

PNL1: Technology Development to Technology Implementation
Room: Ballroom

Panelists:
- Andrew Lamb, Internet of Production Alliance
- Amit Bhatnagar, founder and CEO of https://accuster.com/
- Ben Savonen, Global Development Incubator

Moderators:
- John Gershenson, Director, Humanitarian Engineering and Social Entrepreneurship program, Penn State
- Toby Cumberbatch, Cooper Union

In this kickoff keynote panel we set the stage for this conference and its theme - DOING. Three panelists, with extensive experience in engineering with communities, will give brief introductory remarks on their background and their view of the distance between technology development and technology implementation in their fields. Then, with the aid of a moderator, we will further explore challenges and opportunities in bridging development and implementation.

Thursday, October 24 10:30 – 11:50 (America/New_York)

1A: AI in Education
Chair: Robert Caverly (Villanova University, USA)
Room 115

10:30 *A Review on the Feasibility of AI-supported Education Platforms in Afghanistan: Addressing Barriers to Women and Girls' Education*
Aziz Ullah Karimy (JNTUH, India); Juma Rasuli (Universidade Estadual da Paraíba, Brazil); P Chandrasekhar Reddy (JNTUH, India); Musa Joya (University of Surrey, United Kingdom (Great Britain)); Ali Juma Hamdard (Federal University of Sao Carlos, Brazil); Hassan Rahnaward Ghulami (University of Bologna, Italy)

10:38 *Reimagining Wearables to Bolster Sustainable Development in Low-Resource Settings*
Lauren K Hamamoto, Olivia M Meyer, Priya M Natarajan, Meghan G Young, Annly John and Khanjan Mehta (Lehigh University, USA)

10:46 *Mobile Virtual Reality Design for Healthcare Training in Low Resource Settings*
Matthew Cook, Rachel Umoren and Sara Berkelhamer (University of Washington, USA); Chinyere Ezeaka (University of Lagos, Nigeria); Joseph Fisher (University of Washington, USA); Malik Raji (eHealth4Everyone, Nigeria); Cyril Engmann (University of Washington, USA); Ime Asangansi (eHealth4Everyone, Nigeria)

10:54 *Next-Gen Safety Training: ICT Solutions for Informal Workers in Colombia*
Gregorio E Puello-Socarrás (Corporación Universitaria Minuto de Dios - UNIMINUTO, Colombia)

11:02 *Use of AI to augment multilingual content in cyberspace for development - An Indian case study*
Vijayalakshmi B (Centre for Development of Advanced Computing (CDAC), India); Kondapur Aneesh Deshpande and Nishkarsh Krishan (Centre for Development of Advanced Computing, India)

1B: Climate Change Data
Chair: Christine Pomary
Room 119

10:30 *Potential geographical distribution of the Wheat Streak Mosaic Virus and its impact on food security: prediction based on modelling using climatic factors*
Emmanuel Der Tambile (Amrita Vishwa Vidyapeetham & Amrita School for Sustainable Futures, India); Vilayannur Subramanian Ramachandran and Raji Pushpalatha (Amrita Vishwa Vidyapeetham, India)

10:38 *Reducing Emissions from Taxis in the Galapagos Islands using a Mobile Phone Application*
Pritpal Singh, Ryan Barnwell, William Purcell, Jenny Smith and Catherine Dudrear (Villanova University, USA)

10:46 *A Low-Cost Datalogging and Telemetry IoT Platform for Remote Water Monitoring and Control*
James C Peyton Jones (Villanova University, USA)

10:54 *Co-Designing the Foundations of a Climate Sensitive Infectious Disease Community of Practice*
Madeline De Figueiredo (University of Texas, USA); Rayya El Zein (Climate Sensitive Infectious Disease (CSID) Network, USA); Angela Okune and Miliaku Nwabueze (Code for Science & Society, USA)

11:02 *Characterize human mobility in Nigeria during flooding season and its impact in shaping the spread of Covid-19*
Kailun Liu, Xin Wu, Lele Zhang and Chenfeng Xiong (Villanova University, USA)

Thursday, October 24 11:50 - 12:10 (America/New_York)

BK1: Networking Break
Room: 1st Floor Lobby

Thursday, October 24 12:10 - 13:30 (America/New_York)

2A: Productivity Solutions in Agriculture
Chair: Khanjan Mehta (Lehigh University, USA)
Room 115

12:10 *Influence of the Red-Billed Quelea Bird on Rice Farming in the Kisumu, Kenya Region*
John Gershenson, Alexander Aumen, Gianna Gagliardi, Colleen Kinkead, Van Nguyen and Kaylee Smith (Penn State University, USA)

12:18 *Rainwater Harvesting and Automated Off-grid Irrigation for Food and Water Security in Guatemala*
Arav Sharma and Lisa Shay (The Cooper Union for the Advancement of Science and Art, USA)

12:26 *Design and Fabrication of a Semi-autonomous Tilling Machine*
Jadis A Aganda, Kofi Sannie Amosah and Stephen Kofi Armah (Ashesi University, Ghana)

12:34 *Sustainable Solutions for Livelihood Enhancement in Sadivayal Village: Integrating Agriculture and Clean Energy*
Tangudu Harsha Vardhan, Tejaswi Potu and B Sri Ganesh (Amrita Vishwa Vidyapeetham, India & Amrita school of computing, India); Suneelvijay M and Rithika Nallaparaju (Amrita Vishwa Vidyapeetham, India & Amrita School of Engineering, India); Ilango Karuppasamy (Amrita School of Engineering, Coimbatore, India & Amrita Vishwa Vidyapeetham, India); Renjith Mohan (Amrita Vishwa Vidyapeetham, India)

12:42 *An Indoor Low-Power Hydroponics System for Urban Spaces*
Xiahro Joan Tabios (University of the Philippines Diliman, Philippines); Hannah Chzarmayne Natividad (University of the Philippines, Philippines); John Richard Hizon (University of the Philippines Diliman, Philippines); Marc Rosales (University of the Philippines, Philippines); Jessica Rey and Paul Jason Co (University of the Philippines Diliman, Philippines)

2B: Information for Entrepreneurship
Chair: Pritpal Singh (Villanova University, USA)
Room 119

12:10 *An interactive framework: Understanding community desires through Participatory Video*
Nikola Nizamis and Nina Trauernicht (University of Twente, The Netherlands)

12:18 *Measuring the Efficacy of a Locally Manufactured Face Shield*
Frederick Kojo Chaway Acquah, Gabriel Owusu, Jeremiah Takyi, Danyuo Yiporo and Heather R Beem (Ashesi University, Ghana)

12:26 *Empowering Village Women through CVET: Identifying Challenges, Solutions, and Motivating Factors in Tamil Nadu's Coastal Seaweed Farming*
Soundariya S (Amrita University, India & Center of Women Empowerment and Gender Equality, India); Jisha Mary LG (Amrita Vishwa Vidyapeetham, Amritapuri, India); Srividya Sheshadri (Center for Womens Empowerment and Gender Equality, Amrita Vishwa Vidyapeetham, Amritapuri, India); Marcia L. Mclain (University of Edinburgh, United Kingdom); Amritha N (Center for Women's Empowerment and Gender Equality, Amrita Vishwa Vidyapeetham, Amritapuri, India); Rao R. Bhavani (Amrita Vishwa Vidyapeetham, India)

12:34 *Network of Village Universities for Development of India's Rural Sector*
Ranjan Sen and Bulbul Sen (USA)

12:42 *Open Know-How and An Open Source Hardware Registry As a Unifying Discoverability Mechanism for Open Source Hardware Humanitarian Engineering Projects*
Robert L Read (Public Invention, USA); Christina A. Cole and Victoria Jaqua (Open Source Medical Supplies, USA); Andrew Lamb (Internet of Production Alliance, USA)

Thursday, October 24 13:40 - 14:10 (America/New_York)

THLU: Lunch
Room: Ballroom

Thursday, October 24 14:10 - 15:20 (America/New_York)

HPNL: Panel: Engineering with purpose: The New Humanitarian Technologies Approach
Room: Ballroom

Moderator: Julianna M. Pichardo, IEEE Humanitarian Activities & Sustainable Development Manager

Panelists:

- Stephanie Gillespie, EPICS in IEEE Committee Chair
- Sampath Veeraraghavan, IEEE Humanitarian Technologies Board (HTB), with focus on Tech4Good
- Toby Cumberbatch, IEEE Smart Village (ISV)

Thursday, October 24 15:30 - 16:50 (America/New_York)

3A: Power Grid Solutions
Chair: Prasanta Ghosh (Syracuse University, USA)
Room 115

15:30 *Natural Language Processing Reveals Core Issues in Uganda's Power Grid: A Study of Outages from 2015-2022*
    Joel Mugyenyi (Columbia University, USA); Isaac V. Kinhonhi (Electricity Regulatory Authority, USA); Vijay Modi (Columbia University School of Engineering and Applied Sciences (SEAS), USA)

15:38 *Applying social practice theory to understand user demand in rural microgrids*
    Reesha Arshad and Hassan Abbas Khan (Lahore University of Management Sciences, Pakistan); Rosanna De Rosa (University of Naples Federico II, Italy); Dario Minervini and Ivano Scotti (University of Naples Federico II, Pakistan)

15:46 *Electricity Systems Design for Standalone, Minigrid, Grid-Connected Configurations with Domestic and Flexible Irrigation Loads: A Case Study in Tigray, Ethiopia*
    Yuezi Wu and Terence Conlon (Columbia University, USA); Vijay Modi (Columbia University School of Engineering and Applied Sciences (SEAS), USA)

15:54 *Hybrid Renewable Energy in the Argentine Chaco*
    Alan Mickelson (University of Colorado at Boulder, USA); Guillermo Catuogno (Universidad Nacional de San Luis, USA); Juan Chalbaud (Monte Adentro, Argentina)

16:02 *Design, Economic, and Environmental Analysis of a Stand-alone Solar Photovoltaic System for a Tailoring Business in Burundi*
    Aniekanabasi Ekanem and Pritpal Singh (Villanova University, USA)

3B: Technology for Education
Chair: Maria Guadalupe Lopez Molina (Universidad Iberoamericana Puebla, Mexico)
Room 119

15:30 *Empowering Collaboration: Insights into Teacher Collaboration in West Kenya*
Nimisha Rachel Rackow, Ashley Shea and Ji Zhang (Penn State University, USA); John Gershenson (The Pennsylvania State University, USA)

15:38 *Characterizing Teacher Struggles and Problem Solving Across Kenyan School Categories*
Aayod Kaul, Arushi Singh and George Bodenschatz (Penn State University, USA); John Gershenson (The Pennsylvania State University, USA)

15:46 *Health Science, Engineering and the Arts to Address Maternal Health Disparities: Mothers of Sierra Leone*
MJ Le Vu, Olivia Hauck, Sophie Ritzler, Ellen Murray, Constance Mulligan and Sofia Rousseau (Lehigh University, USA)

15:54 *Ten Years Working with Haitian Educators*
Alan Mickelson (University of Colorado at Boulder, USA); Morisset St. Preux (ITCS, Haiti)

16:02 *Science on Wheels: Transforming Education with Agastya's Mobile Science Labs*
Angelina A Patel and Faatiha Kalam (Lehigh University, USA); Natesh Appaya and Shrishail Dhanawade (Agastya International Foundation, India); Asha Marwaha, Jahid O Hossain, Angelina Penza, Eric R Obeysekare and Khanjan Mehta (Lehigh University, USA)

Thursday, October 24 16:50 - 17:10 (America/New_York)

BK2: Networking Break
Room: 1st Floor Lobby

Thursday, October 24 17:10 - 18:30 (America/New_York)

4A: Diet, Nutrition and Oral Health
Chair: Milton Chen (Vsee, USA)
Room 115

17:10 *A Novel, Voice-Activated Smart Home Assistant Using a Large Language Model for Nutrition Assistance*
Jay Bhardwaj, Hugo Carducci, Kenneth Clark, Nicholas Kennedy, Dylan Smith, Tim Thai, Emily Francis and Ramana Reddy (West Virginia University, USA)

17:18 *Towards Low-Sodium Diets: Low-Cost, Small-Scale Approaches to Food Reformulation and Salt Substitution*
Daniel B Weir, Shane Haycock, Joseph A Menicucci, Jr. and Khanjan Mehta (Lehigh University, USA)

17:26 *Towards Low-Sodium Diets: Educational and Policy Approaches*
Ella Sokich, Asher Mendelson and Daniel B Weir (Lehigh University, USA); Umid Abdullayev (Almaty Management University, Kazakhstan); Joseph A Menicucci, Jr. and Khanjan Mehta (Lehigh University, USA)

17:34 *EasyEat: Personalized Healthy Eating Coach*
Renzo DAmbrosio, Josefina Gallinal, Santiago Souto and Cristina Mayr (Universidad de Montevideo, Uruguay)

17:42 *Advancing Oral Health Equity Through Cross-Cultural Virtual Oral Health Book Clubs: A Participatory Approach with Underserved Children in Ekiti State Nigeria and Del Carmen, Philipines*

    Adekemi Adeniyan (Dentalcare Foundation & Atlantic Fellows, Nigeria); Alfredo Coro Jr (Municipality of del Carmen, Philippines)

4B: Human-Machine Interface
Chair: Alan Mickelson (University of Colorado at Boulder, USA)
Room 119

17:10 *Strengthening Last Mile Health Education Using Amazon Alexa-Enabled Devices: A Preliminary Case Study*

    Sofia A Espinoza-Hernandez, Jahid O Hossain, Zavier R Urbaez, Eric Yang, Elif Ozturk, Aabiskar Thapa Kshetri, Rachel Platt, Eric R Obeysekare and Khanjan Mehta (Lehigh University, USA)

17:18 *Leveraging AI Face-Tracking and Gesture Recognition for Hands-Free Computing: Bridging the Gap for Users with Physical Disabilities*

    Michael Ruocco, Jack Duggan, Chetan Jaiswal, Brian O'Neill and Karen Majeski (Quinnipiac University, USA)

17:26 *Enhancing Child Safety and Security through Integrated Technology for Urban Areas*

    Aditya Narayan (Amrita Vishwa Vidyapeetham, India); Sarang KP (Amrita Vishwa Vidyapeetham, Amritapuri, India); Viswajith K, Kowshik Marimuthu, Nagarajan P M and Sundara Raman Gopalan (Amrita Vishwa Vidyapeetham, India)

17:34 *Enhancing Type 1 Diabetes Management through Machine Learning*

    Anav Bordia (Basis Independent Silicon Valley, USA)

17:42 *Human Rights and Ethics Guiding Human-Machine Teaming*

    Lubna Dajani (Allternet Ltd., USA & Allternet, USA); Angelo Ferraro (University of South Carolina, USA); Fumihiro Maruyama (National Institute of Advanced Industrial Science and Technology, Japan); Yuchang Cheng (Fujitsu Limited, Japan)

Thursday, October 24 18:50 - 22:00 (America/New_York)

BANQ: Conference Dinner
Room: Ballroom

Speaker: Dr. Revi Sterling, Technical Director, Women in the Digital Ecosystem Fund (WiDEF)

Dr. Revi Sterling has worked to advance digital inclusion in both domestic and international contexts for over 25 years. She is the Technical Director for the Women in the Digital Ecosystem Fund (WiDEF), a White House initiative to close the gender and technology gap. She previously developed and ran the USAID Women Connect Challenge, another presidential program that successfully spanned three administrations.

Friday, October 25, 2024

Friday, October 25 8:00 - 11:00 (America/New_York)
FREG: Registration
Room: Foyer

Friday, October 25 8:00 - 8:30 (America/New_York)
FBK: Breakfast
Room: Ballroom

Friday, October 25 8:30 - 10:20 (America/New_York)
FPNL: Women in Humanitarian Technology Panel
Room: Ballroom

Panelists:
- Dr. Heather Beem, Professor of Engineering, Ashesi University
- Ms. Amina Abubakar, Founder and Chief Consultant, Adaptive Solutions Africa Ltd
- Ms. Sophia Haoui, Software Developer, New Sun Road

Friday, October 25 10:30 - 11:50 (America/New_York)

5A: AI in Agriculture
Chair: Kevin Moore (Colorado School of Mines, USA)
Room 115

10:30 *Robust Estimation of Plucking Points across Seasonal Flushes in Tea with UAV Imaging*
Sanket Junagade, Sanat Sarangi, Swagatam Bose Choudhury, Ruturaj Nivas Patil, Dineshkumar Singh and Srinivasu Pappula (Tata Consultancy Services, India)

10:38 *On Digital Twin for a High Yielding Soybean Variety towards Optimal Field Recommendations*
Swagatam Bose Choudhury, Rushikesh Dattatraya Kulat, Ruturaj Nivas Patil, Abhishek Kumar, Sanat Sarangi and Nandan Rajpoot (Tata Consultancy Services, India); Ajay Mittal (Research, India); Dinesh Singh (TCS & TCS Research and Innovation, India); Srinivasu Pappula (Tata Consultancy Services, India)

10:46 *Effective Regional Prediction for Potato Stress Conditions Across Rabi Seasons*
Rushikesh Dattatraya Kulat, Swagatam Bose Choudhury, Vidit Patil and Sanat Sarangi (Tata Consultancy Services, India); Dinesh Singh (TCS & TCS Research and Innovation, India); Srinivasu Pappula (Tata Consultancy Services, India)

10:54 *Monitoring the impacts of disruption events on agriculture through irrigation detection with remote sensing*
Hasan S Siddiqui (Columbia University in the City of New York, USA); Vijay Modi (Columbia University School of Engineering and Applied Sciences (SEAS), USA)

11:02 *Non-human primate monitoring system: early alert system against crop raids for farms in Nepal*
Daniil Slutskiy, Zach Jacques and Nuno Bazarian (Wentworth Institute of Technology, USA); Saurav Basnet (550 Huntington Ave & Wentworth Institute of Technology, USA); Amir Poudel (Texas A&M University, USA); Prakash Mandhart (Wentworth Institute of Technology, USA)

5B: Entrepreneurship for All
Chair: Peter Silverberg (Consultant, USA)
Room 119

10:30 *Challenges in Rural Innovation and Entrepreneurship: A Lens through Effectuation Theory*
Jayshree Patnaik and Ahla Hashir (Indian Institute of Technology Hyderabad, India)

10:38 *Making on the Move: Bringing Mobile Makerspaces to Under-resourced Communities*
Jahid O Hossain, Angelina Penza, Asha Marwaha, Angelina A Patel, Faatiha Kalam, Eric R Obeysekare and Khanjan Mehta (Lehigh University, USA)

10:46 *Investigating Community Engagement Practices in Short-Term Humanitarian Engineering Projects*
Arooj Masood and Grace Burleson (University of Colorado Boulder, USA)

10:54 *User-Centered Design of a Seasonal Calendar App for Women: Insights from a Case Study in India*
Balu M Menon (Ammachi Labs, Amrita Vishwa Vidyapeetham, Amritapuri, India); Aiswarya K Nampoothiri (Amrita Vishwa Vidyapeetham, Amritapuri, India); Festa Lovin k f (Amrita Vishwa Vidyapeetham & University Grants Commission (UGC), India); Gokul Dev B and Rao R. Bhavani (Amrita Vishwa Vidyapeetham, India)

11:02 *Digital Technology and the Empowerment of Indian Women Micro-Entrepreneurs*
Rimpa Pal and Bhaskar Bhowmick (Indian Institute of Technology, Kharagpur, India)

Friday, October 25 11:50 - 12:10 (America/New_York)

BK3: Networking Break
Room: 1st Floor Lobby

Friday, October 25 12:10 - 13:30 (America/New_York)

6A: Technology for Community Well Being
Chair: Heather R Beem (Ashesi University, Ghana)
Room 115

12:10 *Training of Rural Women to Monitor the Water Quality at the Point of Use to Increase WASH Empowerment in Rural India*
Reshma Ramesh, Sithara GS, Geethu S Gireesh, Reshma R Nair, Athul Ajay; J. Sophie von Lieres and Bhavani R Rao (Amrita Vishwa Vidyapeetham, Amritapuri, India)

12:18 *Viability of Applying Large Language Models to Indoor Climate Sensor and Health Data for Scientific Discovery*
Aidan Chen (VSee, USA & Aidans Tech LLC, USA); Jonathan Du and Aaron Rodriguez (VSee, USA); Ryan Rodriguez (Georgia Institute of Technology, USA); Jack Higgins (IEEE Smart Village, USA); Robin Podmore (IncSys, USA); Ryan Liu and Emin Ilao (VSee, USA); Sam Daniel C Degilla and James Brian Bibiano (VSee, Philippines); Candice Chan (University of California, Davis, USA); Annalicia Pickering (Stanford, USA); Mary Showstark (Yale, USA); Jarone Lee (Harvard, USA); Milton Chen (Vsee, USA)

12:26 *Enabling socio-ecological linkages for Rural River Restoration through Human-Nature Connection*
Rondine C Twist, Esq. (Amrita University, India); J. Sophie von Lieres, Sneha Anil, Arya M V and Krishna G S and Bhavani R Rao (Amrita Vishwa Vidyapeetham, Amritapuri, India)

12:34 *Does a Standards-First Infrastructure Design Neglect Community Context*
Emily Lawson-Bulten (University of Illinois at Urbana-Champaign, USA); Ann-Perry Witmer (University of Illinois Urbana-Champaign & University of Illinois at Urbana-Champaign, USA)

12:42 *Enablers and Barriers to Improved Drinking Water Sources and Safe Water Practices in Rural India*
Reshma Ramesh, Sithara GS, Reshma R Nair, Geethu S Gireesh, Athul Ajay and J. Sophie von Lieres (Amrita Vishwa Vidyapeetham, Amritapuri, India)

6B: The Economics of Sustainability
Bill Whitney (Lehigh University, USA)
Room 119

12:10 *Operational and Financial Analysis of Smallholder Rice Farming in Kisumu, Kenya*
Alexander Aumen, Gianna Gagliardi, Colleen Kinkead, Van Nguyen and Kaylee Smith (Penn State University, USA); John Gershenson (The Pennsylvania State University, USA)

12:18 *Examining Income and Cost Dynamics of Motorcycle Taxi Drivers in Western Kenya*
Purva Gupta and Lauren Wagner (Penn State University, USA); Dorcas Owinoh (Lake Hub Foundation, Kenya); John Gershenson (The Pennsylvania State University, USA)

12:26 *Single-Use Plastics: The Life and Afterlife of Sachets in the Philippines*
Evan J Woodward, Fernanda Sena, Jackson Kramp, Sophia Lin, Avery Nudell-Cook, Eric R Obeysekare and Khanjan Mehta (Lehigh University, USA)

12:34 *Bridging the Digital Divide with Sustainability: Reuse of Landfill-bound Computers in Education*
Yong Lin, Jake Mastrofski and Dylan Fall (Miami University, USA); Astin Lin, Chengyao Wu, Tariq Zaman, Charles Noah Lin and Ming Chen (Awakening Your Child Total Potential, USA)

12:42 *Implementation and Evaluation of LLM-Based Conversational Systems on a Low-Cost Device*
Koga Sakai, Yuji Uehara and Shigeru Kashihara (Osaka Institute of Technology, Japan)

Friday, October 25 13:40 - 14:10 (America/New_York)

FLU: Lunch
Room: Ballroom

Friday, October 25 14:10 - 15:20 (America/New_York)

Keynote: Avner Mizrahi, engageSPARK
"Robocalls" is a dirty word – but should it be? A deep dive into Robocalls for Research and Impact in Low- and Middle-Income Countries
Room: Ballroom

Friday, October 25 15:30 - 16:50 (America/New_York)

7A: Technology Development
Chair: Brian Thomas (Baylor University, USA)
Room 115

15:30 *Implementation of an Open Hardware and Web Platform for Citizen Science Air Quality Monitoring*
Joize Barbie E dela Cruz, Ryan Jonathan Blanco, Ira Nicole J Santos and Jaybie A de Guzman (University of the Philippines Diliman, Philippines); Marc Rosales (University of the Philippines, Philippines); Paul Jason Co, John Richard Hizon, John Jairus D.P. Eslit and Percival Magpantay (University of the Philippines Diliman, Philippines)

15:38 *Real Time Air Quality Sensor System for E-Trikes*
Martina Meg Bayani, Erin Julianne Mariano and Sanroe Estabillo, Rylee Abiño, Anna Margarita Chua, Aaron Tolentino, Miguel Carlos M Menguito, Paul Jason Co and Jaybie A de Guzman (University of the Philippines Diliman, Philippines); Marc Rosales (University of the Philippines, Philippines); John Richard Hizon (University of the Philippines Diliman, Philippines)

15:46 *Assessing Household Cooking Energy Behavior and Potential for Transition to E-Cooking in Informal Urban Settlements*
Vongaishe Mutatu (Columbia University, United States of America); Vijay Modi (Columbia University School of Engineering and Applied Sciences (SEAS), USA); June Lukuyu (University of Washington, USA)

15:54 *Generator efficiency testing: gasoline vs. propane in the Haitian context*
Brian Thomas, Daniel Chang, Ashton McCutcheon, Claudia Oggs and Jacob Webb (Baylor University, USA)

16:02 *Exploring Internet Use for Development in Mozambique*
Nkeshimana Henry Cedrick (Universidade Eduardo Mondlane, Mozambique); Nepeti Nicanor (CEEG, Mozambique)

7B: Emergency Response Technologies
Chair: Neil H Wasserman (George Washington University & Timewave Analytics, LLC, USA)
Room 119

15:30 *The development of a drone capable of transporting humanitarian aid during an emergency*
Mohamed zied Chaari (Qatar University, Qatar); Gilroy Philbert Pereira, Fawwad Daroge and Mohamed Abdelfatah (Qatar Scientific Club, Qatar); Otman Aghzout (Abdelmalek Essaadi, Morocco)

15:38 *Chemonics support to Pakistan during the Covid-19 and 2022 flood response led to optimized health systems*
Wayne Lifshitz (Chemonics Inc., USA); M Tariq (Chemonics, USA)

15:46 *Evaluating the spatial-temporal impact of urban flooding on mobility patterns and point of interest*
Lele Zhang, Xin Wu, kailun Liu and chenfeng xiong (Villanova University, USA)

15:54 *On the Feasibility of Digital VHF Communications in Crisis Scenarios*
Michi Hermann (Technical University of Darmstadt, Germany); Bastian Bloessl (TU Darmstadt, Germany)

16:02 *Geospatial Analysis to Target Vulnerable Population for Direct Cash Transfer Programs*
Tanvir S Mangat (GiveDirectly, USA)

Friday, October 25 16:50 - 17:10 (America/New_York)

BK4: Networking Break
Room: 1st Floor Lobby

Friday, October 25 17:10 - 18:30 (America/New_York)

8A: Technology for Well Being
Chair: James C Peyton Jones (Villanova University, USA)

Room 115

17:10 *Leveraging Technology for Equitable Access to Social Benefits: A Case Study of Civil Society Organization Interventions among Internal Seasonal Migrant Workers in India*
    Alyssia Sanchez, Sami El Sabri, Noah Khan, Alazne Qaisar and Joseph Wong (University of Toronto & The Reach Alliance, Canada)

17:18 *Online Guided Integrated Amrita Meditation (IAM®) to Improve Mental Well-Being and Reduce Perceived Stress During COVID-19 in India*
    Bavani Mohan and J. Sophie von Lieres and Sowndaram C S (Amrita Vishwa Vidyapeetham, Amritapuri, India); Rajiv Prasad (Amrita Vishwa Vidyapeetham University & Amrita School of Business, India)

17:26 *Integrated Amrita Meditation (IAM®): Towards Sustainable Rehabilitation in Prisons Using Digital Mental Well-Being Intervention*
    Bavani Mohan, J. Sophie von Lieres and Sundara Raman Gopalan (Amrita Vishwa Vidyapeetham, Amritapuri, India); Rajiv Prasad (Amrita Vishwa Vidyapeetham University & Amrita School of Business, India)

17:34 *An Intelligent Computer Vision System for Gesture Based Home Automation and Detection of Parkinson's Tremors*
    Evelyn Ding (Plano West Senior High School, USA); Xiaohu Guo (University of Texas at Dallas, USA)

17:42 *A User-Centred Interaction design: A holistic Approach*
    Gibson Kimutai (University of Rwanda & Moi University, Rwanda); Anna Förster (ComNets, University of Bremen, Germany)

8B: Aid, Assistance and The Digital Divide
Chair: Heather R Beem (Ashesi University, Ghana)
Room 119

17:10 *Characteristics and Machine Learning Emulation of Heatwaves in Future Climate of New Jersey - Exploring Data From the CMIP6 Archive*
    Vinay Karthik (Wardlaw Hartridge School, USA)

17:18 *Is Humanitarian Aid Funding Fair and Square? Correlating social justice to humanitarian aid utilisation*
    Zikambiyani Haanyika, Nina Trauernicht, Alberto Martinetti and Eric Lutters (University of Twente, The Netherlands)

17:26 *Investigating Professional Volunteering Experiences in Humanitarian Engineering Projects*
    Sabrina Bradford, Emma Balevic and Grace Burleson (University of Colorado Boulder, USA)

17:34 *Digital Information Content Platform for Sustainable Education and Disaster Resilience with Telecommunications Network-Assisted Remote Monitoring And Management*
    Rannie D. Salvador, Nathaniel Joseph C Libatique and Mark Anthony Melendres (Ateneo de Manila University, Philippines); Gregory Tangonan (Ateneo Innovation Center, Philippines); Joselito Christian Paulus M. Villanueva (National University, Philippines)

17:42 *Determining Digital Divide in Local-Level ICT Usage for 311 Civic Applications*
    Kuheli Sai and David Tipper (University of Pittsburgh, USA)

Friday, October 25 18:50 - 21:30 (America/New_York)

DIN: Dinner on own with new friends