

2021 IEEE International Humanitarian
Technology Conference (IEEE IHTC 2021)

02 - 04 December 2021

IEEE IHTC 2021 Program Overview

UTC	Thursday 02 Dec '21	Friday 03 Dec '21	Saturday 04 Dec '21
11am	Welcome	Plenary 2	Plenary 4
11:15am	ICT4D Supporting Integration of Refugees	Health 1: Supporting Diagnosis and Treatment	ICT4D Applications and Case Studies 1
12:45	Lunch Break	Lunch Break	Lunch Break
13:30	Energy Applications Supporting ICT4D	Health 2: Medical Technology	ICT4D Applications and Case Studies 2
15:00	Break	Break	Break
15:05	Plenary 1	Plenary 3	Plenary 5
15:25	Break	Break	Break
15:30	ICT4D Supporting Education and Training 1	Health 3: Supporting Healthcare Delivery	Ethical Considerations in Technology Implementation and Artificial Intelligence Workshop
17:00	Break	Break	Break
17:05	ICT4D Supporting Education and Training 2	Agriculture and Food Security	Comprehensive Approach to Rural Electrification Processes Workshop
18:40	End of Day	End of Day	Closing Plenary

Plenary Speakers

Plenary 1: *IEEE: Advancing Technology to Benefit Humanity*, Susan Kathy Land, 2021 IEEE President & CEO

Plenary 2: *Humanitarian Activities in Africa, Middle East and Europe*, Antonio Luque, IEEE Region 8 Director (2021 - 2022)

Plenary 3: *Region 7 2021 Humanitarian Activities and Future Plan*, Jason Gu, IEEE Region 7 Director (2020 - 2021)

Plenary 4: *Innovation for Humanitarian Technologies Development in Latin America and The Caribbean*, Alberto Sánchez, IEEE Region 9 Director

Plenary 5: *Activities of IEEE Joint Ad-hoc on Sustainable Development*, Maike Luiken, Vice President, IEEE MGA

Thursday 02 December 2021 (All Times in UTC)

11:00	<p>Welcome Dr Mona Ghassemian, Chair, IEEE UK and Ireland Section Prof Ali Hessami and Prof Paul M Cunningham, IEEE IHTC 2021 Conference Chairs Miriam Cunningham, IEEE IHTC 2021 Technical Program Chair</p>
11:15	<p>ICT4D Supporting Integration of Refugees <i>Chair: Ali Hessami, Vega Global Systems, United Kingdom</i> <i>Inclusive and Accessible Higher Education in Refugee Camps: Kakuma Use-case</i> Amara Amara (IEEE CASS, France); Thierry Agagiate, <u>Gabriela Muller</u> and Alexandre Gosselin (UNIGE, Switzerland) <i>Design of a Passive Prosthetic Hand with Multi-functional Grasps using Parametric Modelling and 3D Printing</i> <u>John-John Cabibihan</u> and Mohammed Mudassir (Department of Mechanical and Industrial Engineering, Qatar University, Qatar) <i>Nanojobs: Towards an Open Crowd Working Platform for Refugees and Displaced Persons</i> <u>Theo Lynn</u> (Dublin City University, Ireland); Patricia Takako Endo (Universidade de Pernambuco, Brazil); Frank Fowley (SFI Centre for Research Training in Digitally- Enhanced Reality (D-Real), Ireland); Pierangelo Rosati (Dublin City University, Ireland); Lye Ogunsanya (Didean, Ireland); and Grace Fox (Irish Institute of Digital Business, Ireland)</p>
12:30	Lunch Break
13:30	<p>Energy Applications Supporting ICT4D <i>Chair: Monica Crosa di Vergagni, Mott MacDonald, United Kingdom</i> <i>A Portable Power Station for Humanitarian Contexts</i> John Barton, Martin Bliss, Chrispin Gogoda Mbewe, Nigel Monk, Diane Palmer and <u>Richard Blanchard</u> (Loughborough University, United Kingdom) <i>Promoting Battery Testing in Developing Countries through Development of a Low-cost Battery Test System</i> <u>Chrispin Gogoda Mbewe</u>, John Barton, Gianfranco Claudio, Martin Bliss, Nigel Monk and Richard Blanchard (Loughborough University, United Kingdom) <i>Energy Transition X Energy Inclusion: A Community Energy Concept for Developing Countries</i> Milagre Manhique (Universite de Technologie de Troyes, France); Raed Kouta (Universite de Technologie de Belfort-Montbéliard, France); Dominique Barchiesi (Universite de Technologie de Troyes, France); Brian O'Regan and <u>Fabio Silva</u> (International Energy Research Centre (IERC), Ireland) <i>Clean Energy Transition in Remote Indigenous Communities: Hydrogen Energy</i> Saada Hussein and <u>Petr Musilek</u> (University of Alberta, Canada)</p>
15:00	Break

IEEE IHTC 2021 Program as at 30 November 2021

Please check website for most up to date program: <https://www.ihtc21.org.uk/>

15:05	<p>Plenary 1: IEEE: Advancing Technology to Benefit Humanity Susan Kathy Land, 2021 IEEE President & CEO</p>
15:25	Break
15:30	<p>ICT4D Supporting Education and Training 1 <i>Chair: Prof. Izzet Kale, University of Westminster, United Kingdom</i> Experiential Learning for High School Students using a Solar Powered Artifact: Engineering Outreach <u>Kai Goodall</u>, D. T. O. Oyedokun, Hilary Chisepo and Pitambar Jankee (University of Cape Town, South Africa) Design of an Edu Communicative Radio Station in ESSA Ruhengeri <u>Oscar Martinez Bonastre</u> and Borja Cabrera (Universidad Miguel Hernandez, Spain) CODI Bot: An Accessible Robot for New Coders <u>Muhammad Usman Ilyas</u>, Muhammad Murtaza Khan (University of Jeddah, Saudi Arabia); Faisal Leghari, Shamyil Bin Mansoor (LearnOBots Pvt Ltd, Pakistan); Ayesha Razzaque (I-SAPS, Pakistan); and Mohammed A. Alqarni (University of Jeddah, Saudi Arabia) Using Chatbot Technologies to help Individuals make Sound Personalized Financial Decisions <u>Reshawn Ramjattan</u>, Patrick Hosein (University of the West Indies, Trinidad and Tobago) and Nigel Henry (Arthur Lok Jack Graduate School of Business, Trinidad and Tobago)</p>
17:00	Break
17:05	<p>ICT4D Supporting Education and Training 2 <i>Chair: Julieta Dominguez-Soberanes, Universidad Panamericana, Mexico</i> Innovator Procedure using 3D Design and Printing of Bone Tissues for Educational and Hospital Applications <u>Rolando Borja</u> and Midori Sánchez (Pontificia Universidad Católica del Perú, Perú) Impact Assessment for Data Network's Rehabilitation. Case of Ecuador Ronny Cabrera (Universidad Técnica Particular de Loja, Ecuador), Andrea Carrión (Motorola Solutions, Ecuador); <u>Roger Clotet</u> (Valencian International University, Spain) and Monica Huerta (Universidad Politécnica Salesiana, Ecuador) Gender Equality: Exploring Aesthetic Programming as a Way to Increase Diversity and Shape Inclusivity in Our Digital Society Fiona Carroll and <u>Rumana Faruque</u> (CardiffMet University, United Kingdom)</p>
18:20	End of Day

Friday 03 December 2021 (All Times in UTC)

11:00	<p>Plenary 2: Humanitarian Activities in Africa, Middle East and Europe <i>Chair: Paul Cunningham, IST-Africa Institute, Ireland</i> Antonio Luque, IEEE Region 8 Director (2021 - 2022)</p>
11:15	<p>Health 1: Supporting Diagnosis and Treatment <i>Chair: Mona Ghassemian, Interdigital, United Kingdom</i></p> <p><i>Technology Supporting Infection Prevention and Control Training in Africa</i> Gerard Lacey (Maynooth University, Ireland; Buyiswa Lizzie Sithole and Anna Vorndran (Infection Control Africa Network (ICAN), South Africa)</p> <p><i>Implementing Open Data Kit Integrating Barcode-based Client Identification in HIV Testing and Linkage to Care: A User-centered Design</i> Paul Macharia, David Katz, (University of Washington, USA), George Otieno, (PATH, Kenya) Monisha Sharma, Beatrice Wamuti, (University of Washington, USA), Harrison Lagat, (PATH, Kenya), Sarah Masyuko, (University of Washington, USA), Chris Obong'o, (PATH, Kenya), Carol Levin, (University of Washington, USA), Rose Bosire, (Kenya Medical Research Institute, Kenya), Mary Mugambi, (Ministry of Health, Kenya), Edward Kariithi, (PATH, Kenya), Bryan Weiner, Carey Farquhar, (University of Washington, USA)</p> <p><i>Mathematical Analysis of Diabetic Foot Healing after Applying SUS and Rapha Protocols</i> Beatriz Freitas Calheira, Marcos Augusto Moutinho Fonseca, Sylvia de Sousa Faria, Rafael Pissinati de Souza and Suelia S. R. F. Rosa (Universidade de Brasília, Brazil)</p> <p><i>Reliable Long-range Communication for Medical Cargo UAVs using Low-cost, Accessible Technology</i> Yan Han Lau, Huachen Wang, Rumesh Sundhakaran, Dani Purwadi, Lingke Ding, Zhen Lee Tee, Ivan-Darien Sian Hern Tan, Tarasvin Pan and Zhi Min Sim (National University of Singapore, Singapore)</p>
12:45	Lunch Break
13:30	<p>Health 2: Medical Technology <i>Chair: Abel Nyamapfene, University College, London</i></p> <p><i>Cost-reduced Engineering of Functional Biomedical Products in Kenya: A case study on Electrocautery Pens</i> Finlay MacNeilage, Phoebe Douglas, John Ekale Aruma, Stanley Simiyu Sitati and Parvez Alam (The University of Edinburgh, United Kingdom)</p> <p><i>Portable Digital Stadiometer for Assessing the Degree of Childhood Malnutrition in Low-Income Countries</i> Stefano Bonaldo, Federico Dal Lago (University of Padova, Italy); Giovanni Putoto (Doctors with Africa CUAM, Italy); Lorenzo Dal Lago (Italy); Enrico Griggio (Mabix Srl, Italy) and Alessandro Paccagnella (University of Padova, Italy)</p>

	<p><i>Haptic Glove for Braille Interpretation for People With Acquired Dual Sensory Loss (ADSL)</i> <u>Angélica María Abad</u>, Xavier Esteban Mendieta and Omar Alvarado Cando (Universidad del Azuay, Ecuador)</p> <p><i>A Manually Actuated Robotic Supernumerary Finger to Recover Grasping Capabilities</i> <u>Leonardo Franco</u> (Università degli studi di Siena, Italy); Domenico Prattichizzo and Gionata Salvietti (University of Siena, Italy)</p>
15:00	Break
15:05	<p>Plenary 3: Region 7 2021 Humanitarian Activities and Future Plan <i>Chair: Paul Cunningham, IST-Africa Institute, Ireland</i> Jason Gu, IEEE Region 7 Director (2020 - 2021)</p>
15:25	Break
15:30	<p>Health 3: Supporting Healthcare Delivery <i>Chair: Bessie Malila, University of Cape Town, South Africa</i></p> <p><i>Leveraging Technology to Improve the Health Outcomes of People Living With Hypertension in Middle and Low Income Communities in Nigeria</i> <u>Onyinye Okafor</u>, Ayoposi Ogboye, Kendra Njoku, K M Jawadur Rahman, Jonas Akpakli, Tochi Ebere and Nneka Mobisson (mDoc Healthcare, Nigeria)</p> <p><i>Redesigning the Sputum Sample Container for TB Diagnosis to Minimize Aerosol Release and Decrease Manufacturing Material</i> <u>Midori Sanchez</u>, Jennifer Wong (Pontificia Universidad Catolica del Peru, Peru); Antonella Delgado (Universidad Nacional de San Agustin, Peru); Yerko Hinostroza and Fanny Casado (Pontificia Universidad Catolica del Peru, Peru)</p> <p><i>Remote Monitoring System for COVID-19 Patients in Home Isolation and Pilot Study Results in a High Altitude Population</i> Juan Jose Sanchez-Huaman, Jose Luis Flores-Vasquez (Universidad Nacional de San Antonio Abad del Cusco, Peru); Paolo Gabriel Cachi-Delgado (Virginia Commonwealth University, Peru); Franklin Cardeñoso-Fernandez, Jack Ezequiel Charalla-Cutipá and <u>Luis Jimenez-Troncoso</u> (Universidad Nacional de San Antonio Abad del Cusco, Peru)</p> <p><i>Early Identification of Potentially Low Performing Community Health Workers in India using an Ensemble Classification Model</i> <u>Ajil Joseph</u> (Tattva Foundation, India); Girdhari Bora and Amod Kumar (Indian Institute of Management, India)</p> <p><i>Exploring Health Data at Birth in parallel with Environment Indicators</i> Doris Kosminsky, Renato Mauro, Lucas Barcellos Oliveira, Júlia Giannella (Federal University of Rio de Janeiro, Brazil); Annette Hester (TheHesterView Inc., Canada); Saint Clair Gomes Junior (Fiocruz, Brazil); Claudio Esperança (Federal University of Rio de Janeiro, Brazil); and <u>Ximena Illarramendi</u> (Fiocruz, Brazil)</p>
17:20	Break

17:25	<p>Agriculture and Food Security <i>Chair: Roberto Murphy, INAOE, Mexico</i></p> <p><i>Social Small-scale Aquaculture: An Alternative for “Mbokaja'i” Guaraní Indigenous Community</i> Stefanny Karina Córdova Rangel (Universidad Iberoamericana, Paraguay), Alexandra María Cáceres Delgado, Romina Maria Villalba González (IEEE Paraguay SIGHT) and Fátima María Raquel Ferreira Mendieta (IEEE Paraguay Section)</p> <p><i>Structural Analysis of Potato Market Behavior using Neural Network Modelling in Peru</i> José Machicao (Universidad Continental, Peru) and Eduardo Zegarra (GRADE, Peru)</p>
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Saturday 04 December 2021 (All Times in UTC)

11:00	<p>Plenary 4: Innovation for Humanitarian Technologies Development in Latin America and The Caribbean <i>Chair: Paul Cunningham, IST-Africa Institute, Ireland</i> Alberto Sánchez, IEEE Region 9 Director</p>
11:15	<p>ICT4D Applications and Case Studies 1 <i>Chair: Aneesh Rajeev SSEN Transmission, Scotland</i></p> <p><i>Community Water System Mapping (CWSMap): A Mobile App for Improved Water Management in Low Resource Settings</i> Lee Voth-Gaeddert (University of the Witwatersrand, South Africa); Andy Florian Irakoze (St. Louis University, United States); Andrew Schranck (Global Health Engineering LLC, United States) and Flavio Esposito (St. Louis University, United States)</p> <p><i>Towards a Low-cost and Mobile System for Quarantine Tracking during Pandemics</i> Maha Yaghi, Tasnim Basmaji, Abdullah Alsalmani, Reem Salim and Mohammed Ghazal (Abu Dhabi University, United Arab Emirates)</p> <p><i>e-IHT: A Novel Ethical Methodology for the Integration of Intelligent ICT4D and Humanitarian Technologies, within the Framework of Cultural Preservation</i> Luis F. García-Lara (Department of Design, Faculty of Architecture, Art and Design, Universidad Catolica de Temuco, Chile); Ignacio G. Bogueño-Córdova and Alfonso O. Ehijo-Benbow (Department of Electrical Engineering, Faculty of Physical and Mathematical Sciences, Universidad de Chile, Chile)</p>
12:30	Lunch Break
13:30	<p>ICT4D Applications and Case Studies 2 <i>Chair: Mohammed Zeyad, Heriot-Watt University, Scotland</i></p> <p><i>From e-Waste to Robots: A Case Study on e-Waste Upcycling in Low-to-middle Income Countries</i> Ateeq Ur Rehman, Jonah Mack and Parvez Alam (The University of Edinburgh, United Kingdom)</p>

	<p><i>Satellite Image Segmentation of Gold Exploration Areas in the Amazon Rainforest Using U-Net</i> <u>José Matheus Carvalho Boaro</u>, Pedro Thiago Cutrim dos Santos (Computer Applied Group, Brazil); Arthur Serra (TeleMidia Lab, Brazil); Venicius Garcia Rego, Carlos Vinicios Martins and Geraldo Braz Junior (Computer Applied Group, Brazil)</p> <p><i>The Role of ESG in Sustainable Development: An Analysis through the Lens of Machine Learning</i> Akshat Gupta, <u>Utkarsh Sharma</u> and Sandeep Kumar Gupta (Shiv Nadar University, India)</p>
15:00	Break
15:05	<p>Plenary 5: Activities of IEEE Joint Ad-hoc on Sustainable Development <i>Chair: Ali Hessami, Vega Global Systems, United Kingdom</i></p> <p>Maike Luiken, Vice President, IEEE MGA</p>
15:25	Break
15:30	<p>Ethical Considerations in Technology Implementation and Artificial Intelligence Workshop <i>Workshop Chair: Keeley Crockett, Manchester Metropolitan University, UK</i></p> <p>The aim of this workshop is to raise awareness of the ethical, social, moral and environmental responsibilities of implementing digital technologies that include Artificial Intelligence products and services.</p> <p><i>Welcome and overview - Ethical considerations for developing responsible and trustworthy technologies</i> Keeley Crockett, Manchester Metropolitan University, UK</p> <p><i>Ethical Considerations in Technology Implementation and AI Panel</i> <i>Panel Chair: Prof. Paul Cunningham, IST-Africa Institute, Ireland</i></p> <ul style="list-style-type: none"> • Nell Watson, Chair & Vice-Chair respectively of the IEEE's ECPAIS Transparency Experts Focus Group, and P7001 Transparency of Autonomous Systems committee on A.I. Ethics & Safety, UK • Nelishia Pillay, University of Pretoria, South Africa • Dora Kaufman, Pontifical Catholic University of São Paulo, Brazil • Sean Brophy, Manchester Metropolitan Business School, GM AI Foundry, UK <p><i>Overview of the IEEE 7000 standard</i> Prof. Ali Hessami</p> <p><i>Wrap up and Close</i></p>
17:00	Break

17:05	<p>Comprehensive Approach to Rural Electrification Processes Workshop <i>Workshop Chair:</i> Dr. Riccardo Mereu, Politecnico di Milano, Italy</p> <p>This Workshop aims at promoting the comprehensive electrification strategy, overcoming the traditional simplified techno-economic approaches that are being revolutionized more and more to include social and environmental evaluations to provide a long-term perspective. Among others, the experience of the H2020 project "Long-Term AU-EU Partnership in Renewable Energy (LEAP-RE)" is presented.</p> <p>Keynote: Jon Exel, ESMAP - World Bank</p> <p>Panel contributions:</p> <ul style="list-style-type: none">• Mr. Darlain Edeme, Politecnico di Milano (Italy): <i>Vast scale prefeasibility studies in rural electrification programs design</i>• Dr. Davide Fioriti, University of Pisa (Italy): <i>Long-term planning of rural microgrids: how socio-economic challenges steer the technical sizing</i>• Dr. Giacomo Falchetta, IIASA: <i>Energy access investment, agricultural profitability, and rural development: time for an integrated approach</i>• Mr. Nicolò Stevanato, Politecnico di Milano (Italy): <i>Comprehensive energy solution planning for rural electrification</i>• Dr. Luc Richaud, Odit-e (France): <i>Lateral electrification: Towards a viable technological, sociological and economical path to build smart power infrastructure in Africa from the bottom-up</i> <p>Wrap up and Close</p>
18:35	Closing Plenary