Supported by

Ministry of Science, Technology and Innovation
Republic of Uganda

Hosted by

IST-Africa 2020
Final Programme

18 - 22 May 2020

Technical Co-Sponsor

Photograph Copyright (c) Uganda Tourist Board
Introduction

Due to the unprecedented circumstances during the COVID-19 pandemic, IST-Africa 2020 will take place as a virtual event from 18 - 22 May. An activity of IST-Africa, IST-Africa 2020 is the fifteenth in an Annual Conference Series bringing together senior representatives from leading public, private, education & research organisations, to discuss ICT policy, showcase research results and share knowledge.

European research activities are structured around consecutive multi-annual programmes, or so-called Framework Programmes. Horizon 2020 sets out the Priorities and thematic areas, including ICT, for 2014 - 2020. Horizon 2020 is fully open to international co-operation with the aim to jointly address major challenges where significant added value is expected to be gained from a world-wide R&D cooperation. In this context, the European Commission co-funded IST-Africa from 2006 - 2018, to promote African - European research cooperation and support Information Society and ICT aspects of the Africa-EU Strategic Partnership.


IST-Africa directly supports Information Society, Innovation and ICT aspects of the Africa-EU Strategic Partnership, the Science, Technology and Innovation Strategy for Africa (STISA-2024), the Digital Transformation Strategy for Africa (2020-30) and the UN Sustainable Development Goals.

The goals of the IST-Africa Conference Series are Community Building to facilitate EU-African research cooperation and successful exploitation of Research and Innovation results, to stimulate take-up of RTD results, to promote knowledge sharing between commercial, government and research organisations, to exchange experiences about the current state of eAdoption at a sectoral, national or regional level, to support International Cooperation and open up the European Research Area (ERA) to Africa.

Who will you meet?

IST-Africa 2020 Conference attracts policy makers, practitioners, and researchers from leading commercial, government and research organisations around the world. Unlike many research conferences, IST-Africa provides an opportunity to meet with senior managers, practitioners, project managers, software engineers and researchers from industry, government and research organisations. Delegates and speakers attend to share knowledge, experience and lessons learnt, and network with their peers from around the world.

IST-Africa 2020 Conference also provides the unique opportunity to identify partners and opportunities to co-operate in international ICT research projects co-funded by the European Commission under Horizon 2020. The Programme also facilitates sharing of interim results from ongoing Horizon 2020 projects as well as projects supported by national and international funding sources.

Virtual Event

Due to the unprecedented circumstances during the COVID-19 pandemic, IST-Africa 2020 will take place as a virtual event from 18 - 22 May.
International Programme Committee

A distinguished Programme Committee reviewed and provided feedback on blind peer reviewed papers. The IST-Africa 2020 International Programme Committee includes:

- Paul Cunningham (Conference Chair), IST-Africa Institute / IIMC, Ireland
- Tiwonge Banda, UbuntuNet Alliance, Malawi
- Dr Donia Smaali Bouhlila, University of Tunis El Manar, Tunisia
- Laurens Cloete, University of Pretoria, South Africa
- Miriam Cunningham, IST-Africa Institute / IIMC, Ireland
- Dr Emmanuel Eilu, Uganda Christian University, Uganda
- Dr Emanuele Eiuli, Uganda Christian University, Uganda
- Prof. Jelel Ezzine, ENIT, Tunisia
- Prof. Kenneth Foster, North Carolina State University, USA
- Dr Charmayne Hughes, Health Equity Institute, San Francisco State University, USA
- Prof. Mohamed Jmaiel, University of Sfax, Tunisia
- Dr Chipo Kanjo, Chancellor College, University of Malawi, Malawi
- Vasilis Koulolias, eGovLab / DSV, Sweden
- Kristina Lahde, Saliens Ltd, Finland
- Ilari Lindy, SAIS 2, Namibia
- Prof. Johann Marquez-Barja, University of Antwerp / imec, Belgium
- Prof. Maurice Mars, University of KwaZulu-Natal, South Africa
- Dr Tendani Mawela, University of Pretoria, South Africa
- Morten Møller, GRENEN, Denmark
- Dr Tshiiamo Motshegwa, University of Botswana, Botswana
- Esteban Municio, University of Antwerp - imec, Belgium
- Dr Joshua Ndlege, United States International University - Africa, Kenya
- Dr David Padi, DOS, United Nations, USA
- Dr Fungai Bunu Shava, Namibia University of Science and Technology, Namibia
- Prof. Darelle van Greunen, Nelson Mandela University, South Africa
- Prof Darelle van Greunen, Nelson Mandela University, South Africa
- Dr Fungai Bunu Shava, Namibia University of Science and Technology, Namibia
- Prof. Darelle van Greunen, Nelson Mandela University, South Africa

Organising Committee

- Miriam Cunningham, IST-Africa Institute / IIMC, Ireland
- Paul Cunningham, IST-Africa Institute / IIMC, Ireland
- Emmanuel Freddie Mugunga, Ministry of Science, Technology and Innovation, Uganda
- Dr Maxwell Otim, Ministry of Science, Technology and Innovation, Uganda

Conference Secretariat

IIMC Ltd / IST-Africa Institute
Docklands Innovation Park, 128 East Wall Road, Dublin 3, Ireland
Tel: +353 (0) 1 8170607, Fax: +353 (0) 1 8170606
e-mail: secretariat@IST-Africa.org
www.IST-Africa.org/Conference2020
Monday, 18 May, 2020

09:00 Opening Plenary 1

Welcome Address
Paul Cunningham, IST-Africa Institute, Ireland
Moctar Yedaly, Head, Information Society, African Union Commission
Prof. Magdalena Salazar Palma, Director, IEEE Region 8
Dr. Elioda Tumwesige, Minister for Science, Technology and Innovation, Uganda

09:30 Session 2: eInfrastructure
Advancing Rural Connectivity in South Africa through Policy and Regulation: A Case for Community Networks
Shaun Pather, University of the Western Cape, South Africa
Telecentre Users as Mediators of Empowerment of Rural Communities in Malawi
Sellina Khumbo Kapondera, Royal Holloway University of London, United Kingdom
Silent Adoption of Bring-Your-Own-Device in Tanzania Higher Learning Institutions - Adoption Policies
Mawazo Magesa, Sokoine University of Agriculture, Tanzania
Electricity and Solar Power in Health Institutes, complexities in rural Zimbabwe
Ronald Manhibi, SolidarMed, Zimbabwe

10:45 Break

10:50 Session 3: Global Development Applications and Case Studies
Unmanned Aerial Vehicles: Opportunities for Developing Countries and Challenges
Sheila Mugala, Makerere University, Uganda
Transforming Paratransit in Africa’s congested Cities: An ICT-enabled Integrated Demand Responsive Transport (IDRT) Approach
Innocent Ndibatya, Stellenbosch University, South Africa
Assessment of the Value of an Academic Preparation for Short-Term International Humanitarian Missions
Bernard Cohen, Neurological Monitoring Associates, LLC, United States

12:00 Plenary 4

IST Diplomacy in the Fight against Covid-19 - Perspectives from South Africa
Dr Phil Mpwara, Director General, Department of Science and Innovation, South Africa

12:25 Lunch Break

13:25 Session 5: Societal Implications of Technology - Supporting Financial Transactions
Role of Mobile Applications in Mitigating Challenges Faced by Informal Saving Groups
Patrick Kanyi Warnuyu, USIU-Africa, Kenya
Towards Small-Scale Farmers Fair Credit Scoring Technique
Benjamin Otieno, Kibabii University, Kenya

14:40 eReadiness of Namibian SME Retailers to Adopt B2C eCommerce
Kululeko Mthembo, Namibia University of Science and Technology, Namibia

15:10 Break

15:15 Session 7: Societal Implications of Technology 3
Managing the Challenges of the Digital Divide among First Year Students: A Case of UKZN
Temitayo Faloye, University of KwaZulu-Natal, South Africa
Industry 4.0: University Students’ Perception, Awareness and Preparedness - A Case of Namibia
Aussie Mutalya, International University of Management, Namibia
Semantic Web and Grid Technology use in Collaborative Researches for Universities in Kenya
Julius Murumba, The Technical University of Kenya, Kenya

17:30 End of Sessions
Tuesday, 19 May, 2020

09:00 Session 8: eGovernment

Evaluating a Citizen-Centric e-Government Solution in Practice
Karin Fröhlich, Aalto University, Finland

Digital Ecosystems for Public Enterprises: Prospects and Challenges
Simon Shikongo, Namibia University of Science and Technology, Namibia

Open Innovation in Government Services: An Empirical View of Citizens’ Participation
Collins Oduor Ondiek, United States International University- Africa, Kenya

Smart City Citizens’ Service Provision using Participatory Design and Participatory Sensing: Lessons for Developing Cities
Stephen Kyakulumbye, University of the Western Cape, South Africa

Increasing Participation and Security in Student Elections through Online Voting: The Case of Kabarak University
Moses Thiga, Kabarak University, Kenya

10:40 Plenary 9

The Digital Transformation Strategy for Africa (2020-30)
Moses Bayingana, Senior Policy Officer for ICT, African Union Commission

11:00 Break

11:05 Session 10: Content Technology Applications

Towards a Sign Language Hand Gesture Recognition Design Framework
Casam Nyaga, University of the Free State, South Africa

Instagram as a New Marketing Platform for Informal Traders in Tanzania
Nasibu Mramba, College of Business Education, Tanzania

A Framework for Items Recommendation System Using Hybrid Approach
Samuel Wairegi, Jomo Kenyatta University of Agriculture and Technology, Kenya

Question Answering using Automatically Generated Semantic Networks – the case of Swahili Questions
Barack Wanjawa, University of Nairobi, Kenya

12:30 Lunch Break

13:30 Plenary 11

Research and Innovation for Sustainable Development-Future Perspectives
Fadila Boughanemi, Deputy Head, International Cooperation II (Asia, Africa, Middle East & External Relations), DG Research and Innovation, European Commission

13:55 Session 12: eHealth Issues and Applications 1

Prediction of Cancer Basing on Risk Factors using Ensemble Learning
Ruth Wario, University of the Free State, South Africa
Wednesday, 20 May, 2020

09:00 Session 15: Entrepreneurship in Uganda

IEEE Entrepreneurship at a Glance
Janati Nakimera, IEEE Uganda Section, Uganda

The Future of Startups in the Era of Artificial Intelligence
Baron Ezabo, Woxsan City Project, Uganda

Online Digital Payments that Every Startup Should Consider
Kenneth Bintu, Cavendish University Uganda, Uganda

10:00 Plenary 16

SAIS Programme - Supporting Innovation and Entrepreneurship in Southern Africa
Ilari Lindy, SAIS2, Namibia

10:25 Break

10:30 Session 17: Next Generation Computing

Using the Internet-of-Things and Clustering Algorithms to Help Allocate Temporary Work to the Unemployed
Laurie Bulgereit, Nelson Mandela University, South Africa

Towards a Strategic Application of IoT and Big Data for African Societal Solutions
Jackson Machii, The Technical University of Kenya, Kenya

Checkpointing as a Counter to Security Issues in Cloud Computing Infrastructures
John Msagha Mbogholi, Maseno University, Kenya

Personal Cloud Computing Adoption: Integrating IT Mindfulness with TAM
John Oredo, University of Nairobi, Kenya

A Prototype of an Android Application Controlled Lawnmower
Valerianus Hashiyana, University of Namibia, Namibia

12:15 Lunch Break

13:15 Plenary 18

IEEE Humanitarian Activities Committee - Supporting Sustainable Development
Paul Kostek, IEEE Humanitarian Activities Committee Events Chair

13:30 Break

13:35 Session 19: Cyber Security Issues - 1

Secure Information Infrastructure Framework Components for a Smart City: A Case Study of Windhoek
Fungai Bhunu Shava, Namibia University of Science and Technology, Namibia

Design and Implementation of an IPSec Virtual Private Network: A Case Study at the University of Namibia
Flavia Kyeyago Ouma, Uganda Bureau of Statistics, Uganda

A Systematic Review: Vulnerability Assessment of Wi-Fi in an Educational Institution
Emily Bagarukayo, Makerere University, Uganda

A Methodology for Evaluating Security in MNO Financial Service Model
Sigisbert Rwiza, University of Dar es Salaam, Tanzania

15:00 Break

15:05 Session 20: Cyber Security Issues - 2

A Two-tier Fragile Audio Watermarking Algorithm Final
Dumisani Mfune, Mzuzu University, Malawi

Social Engineering Based Cyber-Attacks in Kenya
James Obuhuma, Africa Nazarene University, Kenya

Using Apriori Algorithm Technique To Analyze Crime Patterns for Kenyan National Crime Data: A County Perspective
Edgar Adero, Technical University of Kenya (TUK), Uganda

A Real-Time Location Based Prototype for Notification of Crime Hotspots Using Crowdsourcing
Bernard Alaka, Strathmore University, Kenya

Emerging Network Security Issues in Modern Tertiary Institutions
Knowledge Rusere, University of South Africa, Namibia

16:45 End of Sessions
Thursday, 21 May, 2020

09:00 Session 21: Technology-Enhanced Learning 1 - Supporting Skills Development

Starting from Scratch: Introducing Primary School Learners to Programming
Afikile Sikwebu, Nelson Mandela University, South Africa

Learning to program on KaiOS: a Hands-on Coding School for Developing Climate Service Apps
Ville Myllynpää, University of Turku, Finland

Co-designing a European Future Tech Lab in Africa as a Place for Open Innovation
Marko Lahti, University of Turku, Finland

10:15 Plenary 22

AfricaConnect: a Past, Present and Future Success Story for African Research and Education
Tom Fryer, Head of International Relations, GÉANT

10:40 Break

10:45 Session 23: Technology Enhanced Learning in Schools 2

A Mobile Ad-hoc Strategy to Enhance ICT Based Education in Zimbabwean Rural Schools
Beauty Mugoniwa, UNISA, Zimbabwe

eReadiness Assessment Tool for Schools
Alida Veldsman, Nelson Mandela University, South Africa

SESEMAT In-service Pedagogical Strategies and Student Achievement in Science at Ordinary Level in Tororo SESEMAT Region
Deborah Manyiraho, Busitema University, Uganda

12:00 Lunch Break

13:15 Session 24: Technology-Enhanced Learning 3 - Applications

Nigerian Instructors’ Acceptance of Learning Management Systems: A structural Modelling Approach
Mohammed Yakubu, American University of Nigeria, Nigeria

An Adaptive Gamification Model for e-Learning
Samuel Muthee Kamunya, SEKU University, Kenya

An Innovative Blended Learning Model for Information Technology Courses for a South African University
Nosipho Mavuso, Walter Sisulu University, South Africa

14:30 Break

14:35 Session 25: Technology-Enhanced Learning 4 - Issues and Applications

Manahij App as a Tool to Enhance Students’ Performance Utilizing Data Analytics and Academic Supervision - Case Study: National University Sudan
Muna Mohamed Mahmoud Abu Gosseisa, Ibn Sina University, Sudan

Automated Graduate Training Monitoring: The Case of Gulu University and Strategies for Institutional Adoption
Benedict Oyo, Gulu University, Uganda

Awareness, Accessibility and Usability of eResources: University Students Perspective
Bonnie Obeka Obande, University of Agriculture Makurdi, Nigeria

15:50 Break
Friday, 22 May, 2020

09:00 Session 27: eAgriculture

Blockchain based Milk Delivery Platform for Smallholder Dairy Farmers in Kenya: Enforcing Transparency and Fair Payment
Dorothy Rambim, Masinde Muliro University of Science and Technology, Kenya

Co-design of an Agricultural Management Application for Small-Scale Farmers
Martin Ujakpa, International University of Management, Namibia

Harnessing the Uptake and Utilization of the Agro-based Mobile (ZillApp) Application among Farmer Communities and Disadvantaged Women and Youth in Uganda
Lwanga Herbert, LOG’EL PROJECT / IEEE SIGHT, Uganda

Computer Vision for Smart Farming and Sustainable Agriculture
Ronald Tombe, University of Kwazul Natal, South Africa

10:30 Plenary 28

IEEE Africa Council
Vincent Kaabunga, IEEE Africa Council Chair

10:45 Break

10:50 Session 29: Green-energy driven Technology Solutions for Sustainable Small-scale Farming

Introduction of LEAP-AGRI Programme
Darelle van Greunen, Nelson Mandela University, South Africa

Project Africa
Waldir Moreira, Fraunhofer AICOS, Portugal

IoT Sensing Platform for e-Agriculture in Africa
Waldir Moreira, Fraunhofer AICOS, Portugal

Mobile Applications in Support of Small-scale Crop Farming
Darelle van Greunen, Nelson Mandela University, South Africa

Wrap Up

12:00 Lunch Break

13:15 Session 30: eAgriculture & Environmental Sustainability

Use of Participatory Approach to Determine Adoption of ICTs Agricultural Services
Jasper Ondulo, Masinde Muliro University of Science and Technology, Kenya

Usability as Critical Success Factor of Mobile App for Pesticides Authenticity Verification: Reducing Risks for Farmers in Tanzania
Catherine Cleophace Ngrwa, Dar es salaam University College of Education, Tanzania

Development of an Integrated Framework for Knowledge Sharing and Integration on Land use and Land Management in West-Africa
Mahamadou Belem, Université Nazi Boni, Burkina Faso

14:15 Break

14:20 Session 31: Environmental Sustainability

ITIKI Success Story: Classic Application of Design Thinking
Muthoni Masinde, Central University of Technology, South Africa