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| **Telecommunication Development Advisory Group (TDAG)**  **25th Meeting, Geneva, 2-5 June 2020** | C:\Users\comas\AppData\Local\Temp\Rar$DRa0.735\jpg\ITU official logo_blue_RGB.jpg | |
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|  | **Document** **TDAG-20/INF/5-E** |
|  | **13 February 2020** |
|  | **English only** |
| Telecommunication Standardization Bureau | |
| Evaluation of Kaleidoscope 2019 papers with respect to relevance  in ITU activities and ITU Kaleidoscope 2020 | |
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| **Summary:**  This document provides an overview of the ITU Kaleidoscope academic conference 2019 (K-2019) that was held in Atlanta, Georgia, United States, from 4-6 December 2019. Attached to this TD is a document which presents a keynote speech, invited papers and accepted papers selected for presentation and publication, and identifies links to related activities in ITU-T and other ITU sectors. The Annex to this document also announces the next Kaleidoscope edition “Industry-driven digital transformation”, that will be held in Ha Noi, Viet Nam, 7-9 September 2020.  **Action required:**  TDAG and ITU-D Study Groups are invited to review the papers relevant to their scope of work, and to take into consideration this input from the research community. This report was presented at TSAG, Geneva, 10-14 February 2020 [TSAG [TD689](https://www.itu.int/md/T17-TSAG-200210-TD-GEN-0689/en)], and tailored TDs are also being submitted to the ITU-T study groups and focus groups. In addition, this report will be transmitted to RAG.  **References:** | |

Highlights of the conference

The ITU Kaleidoscope conference 2019 (K-2019), "ICT for Health: Networks, standards and innovation", organized in collaboration with WHO, was kindly hosted by the Georgia Institute of Technology, Atlanta, Georgia, United States. It was organized back-to-back with the 2nd ITU-Academia Partnership Meeting: Developing Skills for the Digital Era, which was held from 2-3 December 2019, in the same venue.

Nearly 70 delegates from 16 countries participated at the conference and over 30 participants joined remotely. **Photos** can be seen on the [ITU Flickr](https://www.flickr.com/photos/itupictures/albums/72157712255115196) and general information can be found on the event´s [webpage](http://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Pages/default.aspx).

The event was technically co-sponsored by the Institute of Electrical and Electronics Engineers (IEEE), the IEEE Communications Society (IEEE ComSoc) and *The Lancet Digital Health*.

An 11-month, substantial preparatory process was required for this Kaleidoscope edition which involved the efforts and collaboration of dedicated Steering Committee members: Michael Best (Georgia Institute of Technology, USA), Christoph Dosch (ITU-R Study Group 6 Vice-Chairman; IRT GmbH, Germany), Kai Jakobs (RWTH Aachen University, Germany), Mitsuji Matsumoto (Professor Emeritus Waseda University, Japan), Sameer Pujari (WHO, Geneva), Rupa Sarkar (*The Lancet Digital Health*, UK), Daidi Zhong (Chongqing University, China) and Mostafa Hashem Sherif (Consultant, USA), who also chaired the Technical Programme Committee (TPC) of 75 members (all internationally recognized ICT experts from academia, research institutes and the private sector), ensuring transparency through the double-blind peer-review process; partnering organizations which supported the promotion of the conference: Waseda University, the Institute of Image Electronics Engineers of Japan, the Institute of Electronics, Information and Communication Engineers of Japan, the Chair of Communication and Distributed Systems at RWTH Aachen University, the European Academy for Standardization, and the University of the Basque Country.

The Host organized an amazing showcase with reception. Nearly 30 research projects relevant to the conference’s theme were presented by their students and creators. Detailed information is available [here](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Documents/Final_report/K.2019_Showcase.pdf).

The Award Committee, that selected the winners of the awards for the **three best papers**, was composed of four conference attendees: Antoine Bagula (University of the Western Cape, South Africa), Mostafa Hashem Sherif (Kaleidoscope Steering Committee Member and TPC Chair), Jian Song (Tsinghua University, China) and Duncan Sparrell (Consultant, USA). The winning papers are as follows:

**FIRST best paper**: "[Thought-based authenticated key exchange](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Documents/Presentations/S7.1_Phillip_Griffin.pdf)" by Phillip H. Griffin, Griffin Information Security, United States.

**SECOND best paper**: "[Redesigning a basic laboratory information system for the global south](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Documents/Presentations/S4.2_Jung_Wook_Park.pdf)" by Jung Wook Park, Aditi Shah, Rosa I. Arriaga and Santosh Vempala, Georgia Institute of Technology, United States.

**THIRD best paper**: "[Elderly health monitoring system with fall detection using multi-feature based person tracking](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Documents/Presentations/S5.1_Dhananjay%20Kumar.pdf)" by Dhananjay Kumar, Aswin Kumar Ravikumar and Vivekanandan Dharmalingham, Anna University, India; and Ved P. Kafle, National Institute of Information and Communications Technology, Japan.

Alongside the winners of cash prizes, three entrants received **Young Author Recognition Certificates**.

Kaleidoscope 2019 also featured two **Special panels**, entitled Digital transformation of the health sector: The power of Artificial Intelligence and the potential of unstructured and Big Data for public health and Policy and legal considerations in healthcare.

Programme, presentations, abstracts and biographies are available [online](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Pages/programme.aspx), as well as the [Final Report](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Documents/Final_report/K-2019_Final_Report.pdf).

**Highlights** are available on the ITU News Portal:

* [Authentication solution for people with disabilities wins 1st prize at Kaleidoscope 2019](http://news.itu.int/authentication-solution-for-people-with-disabilities-wins-1st-prize-at-kaleidoscope-2019/) **-** Published Wednesday, 18 December 2019

Full papers are reproduced in the [Conference Proceedings](https://www.itu.int/pub/T-PROC-KALEI-2019). All papers will be also available shortly on the IEEE *Xplore* Digital Library. The best papers will be evaluated for potential publication in IEEE Communications Standards Magazine and other international journals. Please contact [kaleidoscope@itu.int](mailto:kaleidoscope@itu.int) for any queries.

Attached is a document presenting one keynote speech, two invited papers, and 20 accepted papers that have been selected by the Steering and Technical Programme Committees of Kaleidoscope 2019, and identifies links to related activities in ITU-T and other ITU sectors.

Upon request, the ITU Kaleidoscope Secretariat can establish contact between Study Groups/Focus Groups and authors, e.g. to arrange for a remote presentation of the findings of the paper during a Study Group/Focus Group meeting.

Annex 2 is structured as follows: **Table 1** gives an overview of all papers and keynote speech. **Table 2** maps the papers and keynote speech to ongoing ITU activities, if applicable. Table 2 also includes links to the respective presentations.

# Next edition

The **twelfth edition** of the ITU Kaleidoscope academic conferences will be held in conjunction with the ITU Digital World 2020, Ha Noi, Viet Nam (7-9 September 2020). The theme and all relevant information can be found on our home [website](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2020/Pages/default.aspx) and the call for papers can be found in the annex.

Annex 1

[](http://itu.int/go/K-2020)

***12th ITU Kaleidoscope academic conference***

**INDUSTRY-DRIVEN DIGITAL TRANSFORMATION**

Ha Noi, Viet Nam, 7-9 September 2020

**Call for Papers**

***Kaleidoscope 2020 – Industry-driven digital transformation*** is the twelfth in a series of peer-reviewed academic conferences organized by ITU to bring together a wide range of views from universities, industry, and research institutions. The aim of the Kaleidoscope conferences is to identify emerging advancements in information and communication technologies (ICTs) and, in particular, areas in need of international standards to aid the healthy development of the Information Society.

**Theme**

The Fourth Industrial Revolution has data analytics at its core, and relies on innovations in fields such as robotics, cyber-physical systems, digital twins, virtual simulation, augmented reality, edge computing, artificial intelligence and blockchain – innovations all contributing to digital transformation of industrial processes.

In particular, the manufacturing sector has been an early adopter of new technologies capitalizing on connectivity and intelligence, but these technologies introduce endless possibilities – the automotive, energy, retail and healthcare industries are all moving in this direction.

**Objective**

*Kaleidoscope 2020* calls for original academic papers sharing insight into ongoing projects and research relevant to digital transformation. It targetsspecialists in the fields of ICT and socio-economic development, including researchers, academics, students, engineers, policymakers, regulators, innovators, and futurists.

**Date and venue**

7-9 September 2020, in conjunction with ITU Digital World 2020, Ha Noi, Viet Nam (6-9 September 2020 - <http://telecomworld.itu.int/>)

**Submission of papers**

Prospective authors are invited to submit full, original papers. The submission should be within eight pages, including a summary and references, using the template available on the conference’s website. All papers will go through a double-blind peer-review process. Submission must be made electronically; see <http://itu.int/go/K-20>20 for more details on online submission (EDAS). Paper proposals will be evaluated based on content, originality, clarity, relevance to the conference’s theme and, in particular, **significance to future standards**.

**Deadlines**

Submission of full paper proposals: ***6 April 2020***Notification of paper acceptance: ***12 June 2020***Submission of camera-ready accepted papers: ***26 June 2020***

**Publication and presentation**

Accepted and presented papers will be published in the Conference Proceedings. In addition, extended versions of selected papers will be considered for publication in the *International Journal of Technology Marketing*, the *International Journal of Standardization Research,* or *the Journal of ICT Standardization.*

**Awards**

A prize fund totalling CHF 6 000.- will be shared among the authors of the three best papers, as judged by the Steering and Technical Programme Committees. In addition, young authors of up to 30 years of age presenting accepted papers will receive Young Author Recognition certificates.

**Keywords**

Information and communication technologies (ICTs), standards, digital transformation, manufacturing and energy management, smart manufacturing, software defined networking, cyber-physical systems (CPS), cloud computing, fog computing, edge computing, mobile technologies, wireless networking (5G and beyond), machine-to-machine, 3D printing, advanced robotics, big data analytics, artificial intelligence (AI), machine learning, internet of things (IoT), industrial internet of things (IoT), RFID technology, cognitive computing, trustworthiness, security, privacy.

**Suggested (non-exclusive) list of topics**

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| **Track 1:**  **Network and computing infrastructure, architecture** | * Design principles, architecture and protocols for IIoT and digital twins * Protocols and mechanisms for seamless IoT communications in wireless sensor networks * Mobile and wireless communications * Architecture and protocols for decentralized networking and services * Cloud, fog and edge architectures |
| **Track 2:**  **Applications and services** | * Smart manufacturing * infrastructure systems * Verification and testing * Virtual and augmented reality |
| **Track 3:**  **Enabling technologies** | * AI and machine learning * Intelligent real time data analytics * Data management (analysis, quality, exchange, interoperability and integration prediction) |
| **Track 4:**  **Security, privacy and trust** | * Security architectures, trust, identity management, protection mechanisms * Threat models and attack strategies * Security applications and management * Lightweight cryptography |
| **Track 5:**  **Social, economic, standards, legal and policy aspects** | * Regulation and standards for industrial Internet tools and services * Multi-disciplinary standardisation * New business models and multi-stakeholder aspects for digital transformation |

**Steering Committee**

Christoph Dosch, ITU-R Study Group 6 Vice-Chairman; IRT GmbH, Germany

Eva Ibarrola, University of the Basque Country, Spain

Kai Jakobs, RWTH Aachen University, Germany

Gyu Myoung Lee, Liverpool John Moores University, United Kingdom

Mitsuji Matsumoto, Waseda University Emeritus Professor, Japan

Roberto Minerva, Télécom SudParis, France

Mostafa Hashem Sherif, Consultant, United States

**Technical Programme Committee**

Chairman: Mostafa Hashem Sherif, Consultant, United States

The Technical Programme Committee is composed of over 60 subject-matter experts. Details are available at: <http://itu.int/en/ITU-T/academia/kaleidoscope/2020/Pages/progcom.aspx>.

**Additional information**

For additional information, please visit the conference website: <http://itu.int/go/K-2020>. Inquiries should be addressed to Alessia Magliarditi at [kaleidoscope@itu.int](mailto:kaleidoscope@itu.int).

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