

**EAI INISCOM 2023 - 9th EAI International Conference on
Industrial Networks and Intelligent Systems Programs**

Day 1	Wed, Aug. 2, 2023	
Time	Room A (Main hall)	Room B
07:30 am-08:30 am	Registration	
08:30 am-08:45 am	Opening Ceremony	
08:45 am-09:30 am	Keynote: Edge Intelligence URLLC for 6G Digital Twin: Joint Communications and Computation Design	
09:30 am-10:00 am	Coffee break	
10:00 am-10:40 am	Tutorial: Digital Twin for 6G ORAN: Taxonomy, Research Challenges, and the Road Ahead	
10:40 am-12:00 pm	S1-INIS: Industrial Networks and Intelligent Systems	
12:00 pm-02:00 pm	Lunch	
02:00 pm-03:20 pm	S2-TCSN: Telecommunications Systems and Networks	S3-IPDA: Information Processing and Data Analysis
03:20 pm-03:50 pm	Coffee break	
03:50 pm-05:10 pm	S4-TCSN: Telecommunications Systems and Networks	S5-SECP: Security and Privacy
05:10 pm-06:00 pm	Closing Address	
06:00 pm-08:30 pm	Banquet and Best Paper Award (Venue: TBA)	

Wednesday, Aug. 2, 07:30 am-08:30 am

Registration

Wednesday, Aug. 2, 08:30 am-08:45 am

Opening Ceremony

Wednesday, Aug. 2, 08:45 am-09:30 am

Keynote: Edge Intelligence URLLC for 6G Digital Twin: Joint Communications and Computation Design

Dr. Trung Q. Duong, Queen's University Belfast, U.K.

Dr. Saeed Khosravirad, Nokia Bell Labs

Room A

Chair: Nguyen-Son Vo, Duy Tan University, Vietnam

Abstract: The future generation of wireless communications requires the stringent quality-of-service (QoS) requirements in terms of very high data rate, ultra-high success reception rate, and minimal latency. Supported by high QoS wireless communications, digital twin has become a game-changing technology in many applications including smart city, manufacturing, automotive, gaming, entertaining, and climate resilience. Edge computing-based wireless ultra-reliable and low-latency communications (URLLC) in 6G has been considered as a key technique to realise the full potential of digital twin. This talk discusses a joint communications and computation design of URLLC multi-tier computing in 6G that supports digital twin networks, not only fundamental requirements, but also enabling technologies, visions, and future challenges.

Biography:

Dr. Trung Q. Duong (IEEE Fellow and AAIA Fellow) is a Chair Professor of Telecommunications at Queen’s University Belfast, U.K. and a Research Chair of the Royal Academy of Engineering, U.K. His current research interests include optimisation, signal processing, and machine learning in wireless communications. He has published more than 420+ published papers with 15,700+ citations and h-index 68. He has served as an Editor for many reputable IEEE journals and been awarded best paper awards in many flagship conferences. He is the recipient of the Royal Academy of Engineering Research Fellowship (2015-2020) and the prestigious Newton Prize 2017. He is a Fellow of IEEE and a Fellow of AAIA.

Dr. Saeed Khosravirad is a member, IEEE) is a Member of Technical Staff at Nokia Bell Labs. In this role, he contributes to innovating the future generation of wireless networks with ultrareliable and low latency communications. He received his Ph.D. degree in telecommunications in 2015 from McGill University, Canada. Prior to that, he received the B.Sc. degree from the department of Electrical and Computer Engineering, University of Tehran, Iran, and the M.Sc. degree from the department of Electrical Engineering, Sharif University of Technology, Iran. During 2018-2019, he was with the Electrical & Computer Engineering department of University of Toronto, Canada as a Visiting Scholar. He is an editor of the IEEE Transactions on Wireless Communications, editor of the IEEE Communications Magazine, and guest editor of the IEEE Wireless Communications magazine. His research fields of interest include wireless communications theory, cellular network technologies with emphasis on ultra-reliable communication for industrial automation, and radio resource management for future cellular networks.

Wednesday, Aug. 2, 09:30 am-10:00 am

Coffee break

At the conference venue

Wednesday, Aug. 2, 10:00 am-10:40 am

Tutorial: Digital Twin for 6G ORAN: Taxonomy, Research Challenges, and the Road Ahead

Dr. Antonino Masaracchia, Queen’s University Belfast, U.K.

Room A

Chair: Nguyen-Son Vo, Duy Tan University, Vietnam

Abstract: Open RAN (O-RAN) Alliance is actively working towards transforming the radio access networks (RAN) industry in a way that both its physical and logical RAN products will be more open, smarter, interoperable, and scalable than contemporary deployments. In this way will be possible to address the inevitable traffic overload of the current networks caused by an expected mobile data traffic explosion, which according to ITU-R will be up to 5016 exabyte per month. Also in this context, the novel and recent concept of DT will play an important key role. Indeed, empowered with artificial intelligence (AI) and machine learning (ML) based mechanisms, DT will support the development of key functionalities of O-RAN architecture like non-real-time (Non-RT) and near real-time (Near-RT) RAN intelligent controller (RIC) modules, used to perform powerful AI aided network performance optimisations. This tutorial discusses a joint communications and computation design of URLLC multi-tier computing in 6G that supports digital twin networks, as well as a possible DT based approach for the implementation of both Non-RT and Near RT modules in O-RAN. Fundamental requirements, but also enabling technologies, visions, and future challenges will be discussed.

Biography:

Dr. Antonino Masaracchia (Member, IEEE) received the Ph.D. degree in electronics and telecommunications engineering from the University of Palermo, Italy, in 2016. From 2017 to 2018, he was a Post-doctoral Researcher at the Sant'Anna School of Advanced Studies, the BioRobotics Institute. Since September 2018, he has been a Research Fellow with the Centre for Wireless Innovation, Queens University Belfast, U.K. His research interests include fifth generation (5G) and beyond 5G networks (6G) oriented services, convex optimization and applied machine learning techniques to wireless communications, reconfigurable intelligent surfaces (RIS), UAV-enabled networks, and ultra-reliable and low-latency communications (URLLC). He has been awarded with the Seal of excellence for the project proposals UAV-DRESS and UAV-SURE, submitted under the Horizon Europe Marie Skłodowska-Curie Actions in 2020 and 2021 respectively. He is actively working in collaboration with industrial partners in the context of Open RAN (ORAN) architecture.

Wednesday, Aug. 2, 10:40 am-12:00 am

S1-INIS: Industrial Networks and Intelligent Systems

Room A

Chair: Nguyen-Son Vo, Duy Tan University, Vietnam

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| 10:40 am | Adaptive Backstepping Sliding Mode Control for Speed of PMSM and peak DC-link voltage in Bidirectional Quasi Z-Source Inverter
Pham, Cong-Thanh (Department of Aviation Automation, Faculty of Electrical and Electronic, Vietnam Aviation Academy); Nguyen Huu, Chan Thanh (Department of Aviation Automation, Faculty of Electrical and Electronic, Vietnam Aviation Academy); Tran, Quoc Khai (Department of Aviation Automation, Faculty of Electrical and Electronic, Vietnam Aviation Academy); Tran, Van Thien (Department of Aviation Automation, Faculty of Electrical and Electronic, Vietnam Aviation Academy); Hong Nguyen, Duc Tam (Department of Aviation Automation, Faculty of Electrical and Electronic, Vietnam Aviation Academy) |
| 10:55 am | Neural Networks with Variational Quantum Circuits
Rizvi, Syed Muhammad Abuzar (Kyung Hee University); Ulum, Muhammad Shohibul (Kyung Hee University); Asif, Naema (Kyung Hee University); Shin, Hyundong (Kyung Hee University) |
| 11:10 am | Sudden Cardiac Arrest Detection Using Deep Learning and Principal Component Analysis |

Pham, Van-Su (Posts and Telecommunications Institute of Technology); Nguyen, Hang-Duy Thi (Posts and Telecommunications Institute of Technology); Le, Hai-Chau (Posts and Telecommunications Institute of Technology); Nguyen, Minh-Tuan (Posts and Telecommunications Institute of Technology)

11:25 am

[Experimental study on Fuzzy PD control for Logistics Transportation Mobile Robot \(LTMR\)](#)

Tran, Khai Quoc (Vietnam Aviation Academy); Nguyen, Thanh Huu Chan (Vietnam Aviation Academy); Pham, Thanh Cong (Vietnam Aviation Academy)

11:40 am

[MQTT-CB: Cloud Based Intelligent MQTT Protocol](#)

Erol, Muhammed Raşit (Istanbul Technical University, Computer Engineering Dept.); Bilen, Tuğçe (Istanbul Technical University); Özdem, Mehmet (Innovation & Product and Service Development Directorate, Türk Telekom); Canberk, Berk (School of Computing, Engineering and The Build Environment, Edinburgh Napier University)

Wednesday, Aug. 2, 12:00 am-02:00 pm

Lunch

At the conference venue

Wednesday, Aug. 2, 02:00 pm-03:20 pm

S2-TCSN: Telecommunications Systems and Networks

Room A

Chair: Antonino Masaracchia, Queen's University Belfast, U.K.

02:00 pm

[A Smart Agriculture Solution Includes Intelligent Irrigation and Security](#)

Nguyen-Tan, Tang (University of Information Technology – Vietnam National University at HCM City); Dang-Ngoc, Chien (University of Information Technology – Vietnam National University at HCM City); LE-TRUNG, Quan (University of Information Technology – Vietnam National University at HCM City)

02:15 pm

[Integrated Intelligent Agent for SNMP-based Network Management System](#)

Ong, Dung Mau (Industrial University of Ho Chi Minh City)

02:30 pm

[Genetic Algorithms for Storage- and Energy-aware Caching and Trajectory Optimisation Problem in UAV-assisted Content Delivery Networks](#)

Vo, Nguyen-Son (Duy Tan University, Vietnam); Lam, Thuong Chi (HUTECH University, Vietnam); Nguyen, Thanh-Hieu (Ho Chi Minh City University of Transport, Vietnam); Phan, Thanh-Minh (Vietnam Aviation Academy, Vietnam); Huynh, De-Thu (The Saigon International University, Vietnam)

02:45 pm

[Joint Computation Offloading and Resource Allocation for Mobile Edge Computing](#)

Erskine, John (Queen's University Belfast); Huynh, Dang Van (Queen's University Belfast)

03:00 pm

[An Open Source Wireless Communication Database for Radio Access Networks](#)

Shengyu, Gao (Shanghai University); Yanzan, Sun (Shanghai University); Jun, Yu (Shanghai University); Yanyu, Huang (Shanghai University); Shunqing, Zhang (Shanghai University); Xiaojing, Chen (Shanghai University); Ming, Gan (Xintu (Wuxi) new energy technology co., ltd)

S3-IPDA: Information Processing and Data Analysis

Room B

Chair: Duc-Man Nguyen, Duy Tan University, Vietnam

- 02:00 pm [Facial Detection and Classification Using Deep Learning-Building Skin Care System](#)
Nguyen, Duc-Man (Duy Tan University); Chau, Anh-Thu T. (Duy Tan University); Phan, Minh-Phu (Duy Tan University); Dong, Phuoc-An (Duy Tan University); Hoang, Nghia-Khue (Duy Tan University); Tran, Kim-Sanh (Duy Tan University)
- 02:15 pm [Multi-modal Speech Emotion Recognition: Improving Accuracy through Fusion of VGGish and BERT Features with Multi-head Attention](#)
DANG, NGOC MINH DUC (FPT University); Tran, Nam Phuong (FPT University); Vu, Thuy-Duong Thi (FPT University); Pham, Nhatr Truong (Sungkyunkwan University); Tran, Anh-Khoa (Ton Duc Thang University)
- 02:30 pm [Performance Analysis of Distributed Learning in Edge Computing on Handwritten Digits Dataset](#)
VO, PHUC TINH (TON DUC THANG University); Nguyen, Viet Anh (FPT University); Nguyen, Xuyen Bao Le (FPT University); DANG, NGOC MINH DUC (FPT University); Tran, Anh Khoa (Ton Duc Thang University)
- 02:45 pm [FLASH: Facial Landmark detection using Active Shape model and Heatmap regression](#)
Nguyen Van, Nam (Thuyloi University)

Wednesday, Aug. 2, 03:20 pm-03:50 pm

Coffee break

At the conference venue

Wednesday, Aug. 2, 03:50 pm-05:10 pm

S4-TCSN: Telecommunications Systems and Networks

Room A

Chair: Antonino Masaracchia, Queen's University Belfast, U.K.

- 03:50 pm [Performance Analysis of RF Energy Harvesting Mobile Edge Computing Network using NOMA scheme with Dual Access Points](#)
Vo, Minh Thong (Duy Tan University); Nguyen, Nam Thanh (Duy Tan University); Truong, Truong Van (Duy Tan University); Ha, Dac-Binh (Duy Tan University)
- 04:05 pm [Joint Design of Reflection Coefficients and Beamforming in Double RIS-Assisted System](#)
Yang, Qiangqiang (Shanghai University); Chen, Yufeng (Shanghai University); Yu, Hongwen (Shanghai University); Tan, Guannan (Huizhou Speed Wireless Technology Company); Masaracchia, Antonino (Queen's University Belfast); Fang, Yong (Shanghai University)
- 04:20 pm [Hybrid Beamforming Design for Multi-user mmWave Sum Rate Maximization](#)

Wang, Chunyang (Shanghai University); Tan, Guannan (Huizhou Speed Wireless Technology Company); Fang, Yong (Shanghai University); Wei, Hao (ZTE Cooperation); Sheng, Zhichao (Shanghai University); Yu, Hongwen (Shanghai University)

04:35 pm

[Multiple Mobile Equipment Localization in Indoor Environment Based on Cell Sectoring](#)

Vu, Viet Thuy (Blekinge Institute of Technology); Ivanenko, Yevhen (Blekinge Institute of Technology); Batra, Aman (University of Duisburg-Essen); Pettersson, Mats (Blekinge Institute of Technology)

S5-SECP: Security and Privacy

Room B

Chair: Dac-Binh Ha, Duy Tan University, Vietnam

03:50 pm

[Enhancing Load Balancing in Cloud Computing through Deadlock Prediction](#)

Le Ngoc, Hieu (Ho Chi Minh City Open University); Tran Cong, Hung (Posts and Telecommunication Institute of Technology)

04:05 pm

[A Secrecy Offloading in Radio Frequency Energy Harvesting NOMA Heterogeneous Mobile Edge Computing Network](#)

Truong, Truong (Duy Tan University); Ha, Dac-Binh (Duy Tan University); Vo, Minh Thong (Duy Tan University)

04:20 pm

[An Application of Non Negative Matrix Factorization in Text Mining](#)

Tran, Bao Nguyen (Vietnam Aviation Academy); Huynh, Son Thanh (Vietnam Aviation Academy); To, Lam Ba (Vietnam Aviation Academy); Nguyen, Tuan Luong Anh (Vietnam Aviation Academy)

04:35 pm

[Mitigating and Analysis of Memory Usage Attack in IoE system](#)

Al-Waisi, Zainab (IMT school for advanced studies); Soderi, Simone (IMT School for Advanced Studies); De Nicola, Rocco (IMT School for Advanced Studies)

04:50 pm

[Physical Layer Security of Heterogenous Networks with Unreliable Wireless Backhaul and Small Cell Selections](#)

O'Boyle, Eoin (Queens University Belfast); Yin, Cheng (University of Surrey)

Wednesday, Aug. 2, 05:10 pm-06:00 pm

Closing address

Room A

Wednesday, Aug. 2, 06:00 pm-08:30 pm

Banquet and Best Paper Award

Venue: TBA