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ICTC 2023

THE 14th INTERNATIONAL CONFERENCE ON ICT CONVERGENCE

"Exploring the Frontiers of ICT Innovation"

October 11-13, 2023 | Lotte Hotel, Jeju Island, Korea

Final Program

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Message from the Chairs

With great pleasure, we would like to welcome you to the 14th International Conference on Information and Communication Technology Convergence (ICTC 2023) being held in Jeju Island, Korea. ICTC 2023 is the representative international conferences in the area of ICT convergence organized by the Korean Institute of Communications and Information Sciences (KICS) with technical co-sponsorship of IEEE Communication Society and IEICE Communications Society, and patronized by leading ICT companies, organizations, and government including Ministry of Science and ICT, ETRI, KOFST, Korea Tourism Organization, Samsung Electronics, SK Telecom, MOASOFT, LG U+, Huawei, LG Electronics, KT, GL associates and Ericsson-LG.

ICTC 2023 features an extremely rich program with the main theme of "Exploring the Frontiers of ICT Innovation." The attendees will have the opportunity to associate with the world's most distinguished industry leaders, researchers, government officials, and academia professionals in the areas of next mobile networks, B5G/6G issues and challenges, AI-based technologies for networking and communications, new waves and spectrum, future ICT services and their enablers, computing-networking convergence, quantum and neural technology, and new ICT paradigms and concepts. During ICTC 2023, distinguished keynote speeches will be delivered by highly prominent experts from Ericsson, Kakao, Nokia Bell Labs, Electronics and Telecommunications Research Institute (ETRI), SK Telecom, and Oregon State University. The industrial experts of LS ELECTRIC, Huawei, China Mobile Research Institute, AIFactory, Asleep, and KDDI Research will deliver their talks. Moreover, special experts of Rochester Institute of Technology, Incheon National University, Seoul National University, Remcom, University of Southern California, University of California Riverside, KAIST, Simon Fraser University, Sungkyunkwan University, Nokia Bell Labs, Quandary Peak Research, Kyonggi University, Korea Institute for Advanced Study (KIAS), Liverpool John Moores University, Chonnam National University, LiberVance, Kyushu Institute of Technology, Sungshin Women's University, and Pukyong National University will give talks in different sessions.

In the technical program, 115 regular papers and 164 workshop papers are organized into 19 technical sessions and 29 workshop sessions, respectively, which will be held in 6 parallel tracks for oral presentations. Also, 203 regular poster papers and 42 workshop poster papers are organized into 7 technical poster sessions and one workshop poster session, respectively. The program covers a variety of topics on recent advances in information and communication technology convergence including Machine Learning, Wireless Access, Networks, IoT, Localization, Mobility, Blockchain, ICT convergence, 6G MIMO/MAC/Core Network, 3D networks, Satellite Communications, Big Data, Cloud and Edge Computing, Military Informatics, Communication and Sensing, Underwater Communication, Quantum Internet, Quantum Deep Learning, and Emerging Technologies. We cordially invite you to join us in Jeju Island from October 11 to 13 for this great ICT event and enjoy Jeju, known as the "Island of the Gods". We especially welcome you to visit and enjoy the natural World Heritage Site Jeju Volcanic Island and Lava Tubes. We look forward to seeing you in Jeju Island and your participation in the ICTC 2023!

Een-Kee Hong
President of KICS

Yongsoon Baek
Organizing Committee Chair

Kwang Soon Kim
Technical Program Committee Chair

Taesik Cheung
Symposia Program Committee Chair

Program at a Glance

October 11th (Wednesday), 2023

Time	Crystal 1	Crystal 2	Crystal 3	Charlotte	Pearl	Ruby	Emerald	Foyer
Floor	6F, Banquet Building							
07:30~17:00	Registration							
08:30~10:30 (120min)	SPC Special Session I Next Generation Wireless Systems and Applications Prof. JeongGil Ko (Yonsei University, Korea)	Session A1 Machine Learning 1 Dr. Cosmas Ifeanyi Nwakanma (Kumoh Nat'l Institute of Technology, Korea)	Session B1 Machine Learning 2 Dr. Haesik Kim (VTT Technical Research Centre, Finland)	Session C1 Algorithms Prof. Asad Masood Khattak (Zayed University, UAE)	Session D1 ICTC Workshop on 3D Communication Networks (IW3CN) Prof. Jihwan Choi (Korea Advanced Institute of Science and Technology, Korea)	Session E1 ICTC Workshop on Artificial Intelligence in Healthcare (IWAIH) Prof. Sunghyun Cho (Hanyang University, Korea)	Session F1 ICTC Workshop on Quantum Deep Learning (IWQDL) Prof. Joongheon Kim (Korea University, Korea)	Session P1 Poster Session 1 Prof. Jun Koo Lee (Sungkyunkwan University, Korea)
10:30~11:00	Coffee Break							
11:00~11:50 (50min)	Plenary Session I : Opening Ceremony and Keynote Speech (Crystal 1, 2, 3) Chair : Prof. Kwang Soon Kim (Yonsei University, Korea, TPC Chair of ICTC 2023) • Opening Address : Prof. Een-Kee Hong, President of KICS • Congratulatory Address : Xuemin Shen, President of IEEE ComSoc • Keynote Speech 1 : Mr. Glenn Parsons, Principal Standards Advisor, Ericsson, "5G Mobile Transport"							
11:50~13:00	Lunch (La Seine - 6F, Main Building)							
13:00~14:30 (90min)	Industrial Session I Dr. Taesik Cheung (ETRI, Korea)	Session A2 Convergence 1 Prof. Haejoon Jung (Kyung Hee University, Korea)	Session B2 Wireless 1 Prof. Dong Seog Han (Kyungpook Nat'l University, Korea)	Session C2 Localization Prof. Syed Imran Hussain Shah (Chung-Ang University, Korea)	Session D2 ICTC Workshop on Information and Communication Strategic Technology for Industry Convergence (IWICST) 1 Prof. Yeonho Chung (Pukyong Nat'l University, Korea)	Session E2 ICTC Workshop on 6G STAR-MAC (IW6STAR) Prof. Dongho Kim (Seoul Nat'l University of Science and Technology, Korea)	Session F2 ICTC Workshop on Satellite Information Utilization (IWSIU, Special Session for ITRC, Ajou University) Prof. Jae-Hyun Kim (Ajou University, Korea)	Session P2 Poster Session 2 Prof. Su Min Kim (Tech University of Korea, Korea)
14:30~14:50	Coffee Break							
14:50~16:20 (90min)	SPC Special Session II Internet of Data Prof. Jeongyeup Paek (Chung-Ang University, Korea)	Session A3 Networks 1 Prof. Suk Chan Kim (Pusan Nat'l University, Korea)	Session B3 IoT 1 Prof. Gabriel Avelino Sampedro (UP Open University, Philippines)	Session C3 Mobility 2 Prof. Junsu Kim (Tech University of Korea, Korea)	Session D3 ICTC Workshop on Information and Communication Strategic Technology for Industry Convergence (IWICST) 2 Dr. Wooyong Lee (Electronics and Telecommunications Research Institute, Korea)	Session E3 ICTC workshop on intelligent 6G (IWin6G) Prof. Wonjae Shin (Korea University, Korea)	Session F3 ICTC Workshop on Post MIMO (IWPMIMO) Prof. Chan-Byoung Chae (Yonsei University, Korea)	Session P3 Poster Session 3 Prof. Youn Kyu Lee (Hongik University, Korea)
16:20~16:50	Coffee Break							
16:50~18:10 (80min)	Plenary Session II : Keynote Speeches (Crystal 1, 2, 3) Chair : Prof. Dong Seog Han (Kyungpook Nat'l University, Korea) • Keynote Speech 2 : Mr. Andrew Yongjoon Kong, Cloud Technical Director, Kakao, "NoCode and LLM not open the new era" • Keynote Speech 3 : Dr. Mikko Uusitalo, Head of Research Department, Nokia Bell Labs, "6G vision and enablers from the European Flagship projects Hexa-X and Hexa-X-II"							

Program at a Glance

October 12th (Thursday), 2023

Time	Crystal 1	Crystal 2	Crystal 3	Charlotte	Pearl	Ruby	Emerald	Foyer
Floor	6F, Banquet Building							
08:00~17:00	Registration							
08:30~10:00 (90min)	**SPC Special Session III** Mobile Systems and Applications Prof. Sangeun Oh (Ajou University, Korea)	**Session A4** Machine Learning 3 Prof. Won-Yong Shin (Yonsei University, Korea)	**Session B4** Wireless 2 Prof. Intae Hwang (Chonnam Nat'l University, Korea)	**Session C4** ICTC Workshop on 6G Core Network (IW6GN) Prof. Yun Won Chung (Soongsil University, Korea)	**Session D4** ICTC Workshop on Quantum Internet (IWQI, Special Session for ITRC, Korea University) Prof. Jun Heo (Korea University, Korea)	**Session E4** ICTC Workshop on Big Data (IWBD) 1 Prof. Jeongyeup Paek (Chung-Ang University, Korea)	**Session F4** ICTC Workshop on SCSS (IWSCSS) 1 Prof. Howon Lee (Hankyong Nat'l University, Korea)	**Session P4** Poster Session 4 Prof. Jeonghun Park (Yonsei University, Korea)
10:00~10:20	Coffee Break							
10:20~11:50 (90min)	**Industrial Session II** Dr. Tae Yeon Kim (ETRI, Korea)	**Session A5** Networks 2 Prof. Jaehoon (Paul) Jeong (Sungkyunkwan University, Korea)	**Session B5** Mobility 1 Prof. Hyun Jong Yang (Pohang University of Science and Technology, Korea)	**Session C5** ICTC Workshop on Emerging Topics in Wireless Communications (IWETWC) Prof. Oh-Soon Shin (Soongsil University, Korea)	**Session D5** ICTC Workshop on KETI International Collaborative R&D Projects (IWKETI) Dr. Kyoung-Taek Lee (Korea Electronics Technology Institute, Korea)	**Session E5** ICTC Workshop on Big Data (IWBD) 2 Prof. Sungrae Cho (Chung-Ang University, Korea)	**Session F5** ICTC Workshop on SCSS (IWSCSS) 2 Prof. Bang Chul Jung (Chungnam Nat'l University, Korea)	**Session P5** Poster Session 5 Prof. Hoki Baek (Kyungpook Nat'l University, Korea)
11:50~13:00	Lunch (La Seine - 6F, Main Building)							
13:00~14:30 (90min)	**SPC Special Session IV** Software, Software, Software! Prof. Youn Kyu Lee (Hongik University, Korea)	**Session A6** Blockchains Prof. DoHyeun Kim (Jeju Nat'l University, Korea)	**Session B6** Wireless 3 Prof. Taesoo Jun (Kumoh Nat'l Institute of Technology, Korea)	**Session C6** ICTC Workshop on Vehicle Edge & Cloud Computing (IWVECC) Prof. Ji-Woong Choi (Daegu Gyeongbuk Institute of Science and Technology, Korea)	**Session D6** ICTC Workshop on ETRI 5G-Adv/6G Technologies (IWETRI) Dr. Ilgyu Kim (Electronics and Telecommunications Research Institute, Korea)	**Session E6** ICTC Workshop on Big Data (IWBD) 3 Prof. Hyosu Kim (Chung-Ang University, Korea)	**Session F6** ICTC Workshop on SCSS (IWSCSS) 3 Prof. Jeongho Kwak (Daegu Gyeongbuk Institute of Science and Technology, Korea)	**Session P6** ICTC Workshop on SCSS (IWSCSS) Poster Prof. Heejung Yu (Korea University, Korea)
14:30~15:00	Coffee Break							
15:00~17:00 (120min)	**Plenary Session III : Keynote Speeches** (Crystal 1, 2, 3) Chair : Prof. Haneul Ko (Kyung Hee University, Korea) • Keynote Speech 4 : Dr. Seung Chan Bang, President, ETRI, "Prospects for advancement of next-generation communications" • Keynote Speech 5 : Dr. Jongmin Lee, Vice President and Head of Future R&D, SK Telecom, "SK Telecom's AI Technologies and Services for Better Future" • Keynote Speech 6 : Dr. Huaping Liu, Professor, Oregon State University, "Data Traffic Trends for an Evolving Mobile Network"							
17:00~18:00	Coffee Break							
18:00~20:00 (120min)	**Banquet** (Crystal 1, 2, 3) • Welcome Address : Dr. Yongsoon Baek, OC Chair of ICTC 2023 • TPC Report : Prof. Kwang Soon Kim, TPC Chair of ICTC 2023 • Awards Ceremony • Banquet Course							

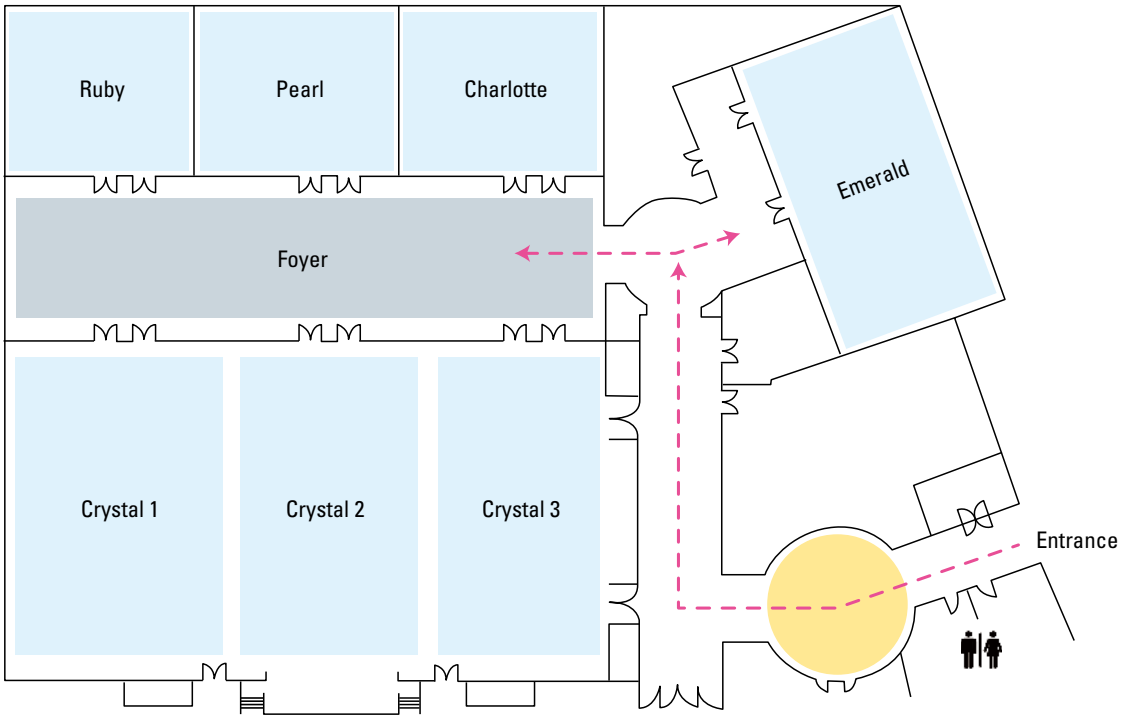
Program at a Glance

October 13th (Friday), 2023								
Time	**Crystal 1**	**Crystal 2**	**Crystal 3**	**Charlotte**	**Pearl**	**Ruby**	**Emerald**	**Foyer**
Floor	**6F, Banquet Building**							
08:00~10:30	**Registration**							
08:30~10:00 (90min)	**SPC Special Session V** Web 3.0 Prof. Hoon Lee (UNIST, Korea)	**Session A7** IoT 2 Prof. Haneul Ko (Kyung Hee University, Korea)	**Session B7** Wireless 4 Prof. Seung-Chan Lim (Hankyong Nat'l University, Korea)	**Session C7** ICTC Workshop on Technologies and Services for Private 5G/6G (IWTSP) Prof. Sangheon Pack (Korea University, Korea)	**Session D7** ICTC Workshop on Intelligent Secure Underwater Communication Technology (IWINSECT) Prof. Namyoon Lee (Korea University, Korea)	**Session E7** ICTC Workshop on Evolutionary Computation and Communication Intelligence (IWECCI) Prof. Won-Yong Shin (Yonsei University, Korea)	**Session F7** ICTC Workshop on Military Informatics (IWMI) 1 Prof. Soo Young Shin (Kumoh Nat'l Institute of Technology, Korea)	**Session P7** Poster Session 6 Prof. Hyosu Kim (Chung-Ang University, Korea)
10:00~10:20	Coffee Break							
10:20~11:50 (90min)	**SPC Special Session VI** Future Networks Prof. Heejun Roh (Korea University, Korea)	**Session A8** Machine Learning 4 Dr. Taesang Choi (Electronics and Telecommunications Research Institute, Korea)	**Session B8** Convergence 2 Prof. Sang Hyun Lee (Korea University, Korea)	**Session C8** ICTC Workshop on Native AI for B5G and 6G (IWNA) Prof. Seung-Woo Ko (Inha University, Korea)	**Session D8** ICTC Workshop on 6G Research Initiative (IW6RI) Prof. Kyunghan Lee (Seoul Nat'l University, Korea)	**Session E8** ICTC Workshop on Communication, Sensing, and Perception for Unmanned Vehicles (IWCSUV) Prof. Igbafe Orikumhi (Hanyang University, Korea)	**Session F8** ICTC Workshop on Military Informatics (IWMI) 2 Prof. Jae-Min Lee (Kumoh Nat'l Institute of Technology, Korea)	**Session P8** Poster Session 7 Dr. Seung-Que LEE (Electronics and Telecommunications Research Institute, Korea)

Session Room Locations

LOTTE HOTEL JEJU

6F, Banquet Building



Plenary Sessions

October 11th (Wednesday), 2023

Plenary Session I : Opening Ceremony and Keynote Speech

11:00~11:50 | Crystal 1, 2, 3

Chair : Prof. Kwang Soon Kim (Yonsei University, Korea, TPC Chair of ICTC 2023)

Time	Title	Invited Speakers
11:00~11:50	5G Mobile Transport	Mr. Glenn Parsons, Principal Standards Advisor, Ericsson

Keynote Speech 1 : 5G Mobile Transport

Mr. Glenn Parsons, Principal Standards Advisor, Ericsson; Chairman of ITU-T SG15; Chair of IEEE 802.1 WG

Abstract:

5G mobile transport is a pivotal element in the advancement of fifth-generation (5G) communication networks, offering a robust and efficient infrastructure to support the immense data demands and ultra-low latency requirements of the 5G mobile ecosystem. Optical transport is fundamental in enabling high-speed and high-capacity data transmission for 5G networks. Fiber-optic cables provide the necessary bandwidth and low latency required to meet the exponential growth in data traffic. But multiplexing, modulation, and framing techniques can all be tuned to the mobile transport application to effectively accommodate the massive data volumes generated by the proliferation of 5G connected devices and bandwidth-intensive applications.

Mobile transport networks for fronthaul and backhaul solutions facilitate the seamless integration of base stations and core networks, ultimately enhancing network performance and reliability. Virtual network slices can also be enabled, each tailored to specific use cases and service requirements. This dynamic network slicing capability enables efficient resource allocation, enabling diverse applications such as autonomous vehicles, industrial automation, and virtual reality.

ITU-T SG15 and IEEE 802 continue to develop foundational standards that are leveraged for mobile transport. They are playing a vital role in enabling the rapid evolution of communication networks, providing the necessary speed, capacity, and reliability to meet the demanding requirements of the 5G era.

Biography:

GLENN PARSONS is an internationally known expert in packet networking, including mobile transport. He is a standards advisor with Ericsson Canada, where he coordinates standards strategy and policy for Ericsson, including network architecture for 5G radio transport networks. Previously, he has held positions in development, product management and standards architecture in the ICT industry. Over the past number of years, he has held several management and editor positions in various standards activities including IETF, IEEE, and ITU-T. He has also been an active participant in the IEEE-SA Board of Governors, Standards Board and its Committees. He is currently involved with 5G transport standardization as the chair of ITU-T SG15, as well as the chair of the IEEE 802.1 WG. In addition to being the founding Editor-in-chief for IEEE Communications Standards Magazine, he was previously a Senior Technical Editor for IEEE Communications Magazine. He graduated in 1992 with a B.Eng. degree in electrical engineering from Memorial University of Newfoundland.

Plenary Sessions

October 11th (Wednesday), 2023

Plenary Session II : Keynote Speeches

16:50~18:10 | Crystal 1, 2, 3

Chair : Prof. Dong Seog Han (Kyungpook National University, Korea)

Time	Title	Invited Speakers
16:50~18:10	NoCode and LLM not open the new era	Mr. Andrew Yongjoon Kong, Cloud Technical Director, Kakao
	6G vision and enablers from the European Flagship projects Hexa-X and Hexa-X-II	Dr. Mikko Uusitalo, Head of Research Department, Nokia Bell Labs

Keynote Speech 2 : NoCode and LLM not open the new era

Mr. Andrew Yongjoon Kong, Cloud Technical Director, Kakao

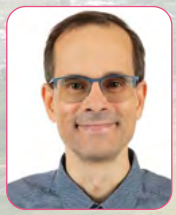
Abstract:
Everyone believes that the convergence of NoCode platforms and Language Models (LLM) has the potential to revolutionize software development by enabling non-technical individuals to create sophisticated applications without the need for traditional coding skills. But I want to talk The machine generated code and application was always there under the humans intention and convenience. I also want to talk that these technology now brings the well-crafted definition of software design.

Biography:
Andrew Kong is the head of cloud computing technology at Kakao. He is researching, developing, and applying AI/machine learning platform development, data center automation, private/public cloud services, and the technologies required for them to actual services. In 2015, he presented his new network model "SDN without SDN" at the OpenStack Summit for the first time. In 2016, he also presented on cloud and networking at the Netdev Conference. He received a master's degree in combustion analysis and is studying neuroscience at medical school. He is also a member of the Korea Information Society Development Institute's Small and Medium Enterprise Technology Advisory Committee and the Korea Database Promotion Institute's Advisory Committee. His major works include "Developer Principles" (Golden Rabbit, 2022), "The Real Story of Cloud Transition" (Aeon, 2020), "Kafka: The Strongest in Data Platform" (Bookman, 2018), and "Big Data Analysis Using Cloud API" (Aeon, 2015).

Keynote Speech 3 : 6G vision and enablers from the European Flagship projects Hexa-X and Hexa-X-II

Dr. Mikko A. Uusitalo, Head of a Research Department, Radio Systems Research Finland, Nokia Bell Labs; EU Hexa-X-II Project Lead

Abstract:
6G has gathered momentum via industrial and academic research as well as especially via some large regional research consortia. In Europe the Flagship projects have been Hexa-X and now Hexa-X-II. This talk will tell about the 6G vision and use cases as recognized by Hexa projects. The status of the work on the needed enablers and architecture are also revealed. Importance of the underlying values sustainability, inclusion and trustworthiness are extended based on the project work.



Biography:
Mikko Uusitalo is Head of Research Department Radio Systems Research Finland at Nokia Bell Labs. Mikko is leading the European 6G Flagship projects Hexa-X and Hexa-X-II. He obtained a M.Sc. (Eng.) and Dr.Tech. in 1993 and 1997 and a B.Sc. (Economics) in 2003, all from predecessors of Aalto University. Mikko has been at Nokia since 2000 with various roles, including Principal Researcher and Head of International Cooperation at Nokia Research.

Plenary Sessions

October 12th (Thursday), 2023

Plenary Session III : Keynote Speeches

15:00~17:00 | Crystal 1, 2, 3

Chair : Prof. Haneul Ko (Kyung Hee University, Korea)

Time	Title	Invited Speakers
15:00~17:00	Prospects for advancement of next-generation communications	Dr. Seung Chan Bang, President, ETRI
	SK Telecom's AI Technologies and Services for Better Future	Dr. Jongmin Lee, Vice President and Head of Future R&D, SK Telecom
	Data Traffic Trends for an Evolving Mobile Network	Dr. Huaping Liu, Professor, Oregon State University

Keynote Speech 4 : Prospects for advancement of next-generation communications

Dr. Seung Chan Bang, President, ETRI

Abstract:

As the explosive increase in new services such as artificial intelligence, metaverse and XR has been a mainstream in cutting edge, the role of communications is becoming more significant than ever. Next-generation communications, represented by 6G, is a key enabler of digital transformation and is expected to be developed on the basis of openness, virtualization and intelligence to accommodate various needs in the future. In addition, it is predicted that the service area will be extended, rather than simply being confined on the ground, to provide hype-space communications that enables services such as free internet in the aircraft and the control of UAMs. Especially, in Korea, communication services utilizing low-orbit satellites are expected be developed for both civil and military use. In this presentation, I will introduce the current status of 6G-related research and discuss the development direction of next-generation communications.

Biography:

Dr. Bang, Seung Chan is a current president of the Electronics and Telecommunications Research Institute (ETRI), Daejeon, Korea. As the president of ETRI since 2022, he is responsible for managing Korea ICT R&D, covering 5G+/6G, AI·SW, AI semiconductor and system semiconductor, metaverse, cyber-security, supercomputer and a quantum computer, and material/device technology.

Dr. Bang had Ph.D., Master, B.S. degree from Seoul national University all in Electronic engineering, 1994, 1986, 1984, respectively.

He joined Goldstar Central Institute in 1986, Digicom Information and Communication Research Institute in 1987, and ETRI in 1994, where he has been at the forefront of the telecommunications field serving in numerous R&D managing positions including Wireless Transmission, Future Technology, Communications and Media, etc. over the last 30 years.

Plenary Sessions

Keynote Speech 5 : SK Telecom's AI Technologies and Services for Better Future

Dr. Jongmin Lee, Vice President and Head of Future R&D, SK Telecom

Abstract:
In the era of AI, the changes in technologies and the industrial landscape are accelerating even more rapidly.
In this presentation, he will introduce SK Telecom's technologies and services powered by AI to address these shifts in the industrial landscape. Furthermore, we will share how SK Telecom is leveraging AI technology to create a cleaner, healthier, and safer world, towards a better future.

Biography:
Dr. Jongmin Lee is Vice President and Head of Future R&D Group at SK Telecom. In this role, he leads the company's ICT R&D strategy and technology-based business development to expand technology portfolio and further strengthen SK Telecom's leadership in global presence.
Prior to his current role, Lee served as Head of Media R&D Center where he dedicated to develop diverse media technologies such as immersive AR/VR and personalized recommendation. He had also led the commercialization of ultra-low latency real-time streaming technology that reduces stream delay. Dr. Lee, 200+ patents holder, has over a decade of experience in the ICT fields - AI, media and wired/wireless telecommunication.
He has been awarded a number of global and national prizes including the Presidential Recognition for his outstanding research and development (R&D) achievements. Also, he has been involved with MPEG and ITU-T as working group Chair and Rapporteur.
Dr. Lee received his M.S. and Ph.D. Degrees from Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea, in 2007 and 2010 respectively.

Keynote Speech 6 : Data Traffic Trends for an Evolving Mobile Network

Dr. Huaping Liu, Professor, Oregon State University

Abstract:
Wireless networks are a key infrastructure that enables the accelerated development of artificial intelligence (AI). As we move into the 7th to 8th generations of the mobile network, smartphones might not be the main type of devices that consume the bulk of the data traffic; intelligent machines such as AI-enabled robots, drones, and transportation-oriented moving vehicles will join smartphones in driving the nonlinear growth of data traffic in the mobile network. We will first discuss the mobile network development trends and new technologies as well as the use of various frequency bands as the mobile network continues to evolve. After a brief analysis of the challenges of these strategies in meeting the accelerated data traffic growth, we present a new scheme that could potentially enable communication at ultra-high spectral efficiencies that are not achievable with any existing communication schemes. We conclude the presentation by discussing some preliminary findings that serve as a new information-theoretic support of this ultrahigh-spectral-efficiency scheme.

Biography:
Huaping Liu is a professor with the School of Electrical Engineering & Computer Science at Oregon State University (OSU), Corvallis, Oregon, USA. Before joining OSU in 2001, he was with the Bell Labs, Lucent Technologies in New Jersey. His research interests include communication theory, wireless communications, and signal processing for communications.

Industrial Sessions

October 11th (Wednesday), 2023

Industrial Session I

13:00~14:30 | Crystal 1

Chair : Dr. Taesik Cheung (ETRI, Korea)

Time	Title	Invited Speakers
13:00~14:30	Korea's Real-time Ethernet Technology, RAPIEnet Introduction, Use Cases, and Future Prospects	Mr. Daehyun Kwon, Network Architect Chapter Leader, LS ELECTRIC
	Deterministic Networking	Ms. Xuesong Geng, Standard Representative, Huawei
	5G/6G User Plane Evolution	Ms. Dan Wang, Project Manager, China Mobile Research Institute

Invited Talk 1 : Korea's Real-time Ethernet Technology, RAPIEnet Introduction, Use Cases, and Future Prospects

Mr. Daehyun Kwon, Network Architect Chapter Leader, LS ELECTRIC; Member of IEC Standardization Management Board

Abstract:
This presentation provides an in-depth look at RAPIEnet, an innovative Korean real-time Ethernet technology. We will begin with an overview of RAPIEnet and its origins, followed by a comprehensive exploration of its applications across diverse sectors, demonstrated with engaging case studies. We will delve into RAPIEnet's unique capabilities and the tangible benefits they bring, focusing on how this breakthrough technology can improve competitiveness within both domestic and international landscapes. A special focus will be given to companies like LS ELECTRIC, as we discuss how RAPIEnet can help such enterprises secure a strong foothold in the global market. Ultimately, we aim to deliver a profound understanding of RAPIEnet's potential, shedding light on the exciting future possibilities this technology holds.

Biography:
[Work experience]
- Network Architect Chapter Leader, LS ELECTRIC Automation R&D Center (2000~)
- Member, IEC Standardization Management Board (2021 ~)
- Member, IEC SyC SM (SEG 7, SG 8) (2014 ~)
- Member, IEC TC 65 (2007 ~)

[Education]
- M. S. in Electronic. Eng., Hanyang University, Seoul, Korea, 2000.
- B. S. in Electronic. Eng., Hanyang University, Ansan, Korea, 1997.

[Award]
- IR52 Jang Young-shil award (2023)
- President's Award of World Standards Day (2016)
- IEC 1906 Award (2013)

Industrial Sessions

Invited Talk 2 : Deterministic Networking

Ms. Xuesong Geng, Standard Representative, Huawei

Abstract:
DetNet [RFC8655] provides the capability to carry specified unicast or multicast data flows with extremely low data loss rates and bounded end-to-end latency within a network domain. DetNet may be used in industrial scenarios, 5G transport network and media transport; this presentation will introduce DetNet's development history, key technology solutions and the current progress of the standard in IETF.

Biography:
Xuesong Geng is Senior IP Standards Representative in Huawei Technologies.
She has 6+ years network design and research experience. Active in Deterministic Networking, 5G Transport and Multicast Source Routing in IETF, with 50+ IETF drafts, 8 + WG drafts; Contributor of books: <SRv6 Network Programming-Ushering in a New Era of IP Networks> (Chinese/English/Arabic) and <The Definitive Guide to SRv6 Network Deployment> (Chinese/English); Recent Paper: "Joint routing and scheduling for large-scale deterministic IP networks", Computer Communications, 2021.

Invited Talk 3 : 5G/6G User Plane Evolution

Ms. Dan Wang, Project Manager, China Mobile Research Institute

Abstract:
3GPP Release 18 has been developing UPF enhancement for Exposure and SBA (UPEAS) to more effectively integrate UPF into the 5GC SBA. This presentation introduces UPEAS related key technologies and benefits as well as the key features of the 5G/6G user plane from the CMCC side.

Biography:
Dan Wang, Master in communication and engineering from Peking University, China. From 2015 to now, Dan works in China Mobile, and as the delegate attend many SDOs meetings e.g. 3GPP SA2, SA6, ETSI MEC, GSMA, 5G ACIA. The repportuer of XRM in 3GPP SA2 Release 18, main contributor of UPEAS in 3GPP SA2 Rel-18.

Industrial Sessions

October 12th (Thursday), 2023

Industrial Session II

10:20~11:50 | Crystal 1

Chair : Dr. Tae Yeon Kim (ETRI, Korea)

Time	Title	Invited Speakers
10:20~11:50	Building an AI Ecosystem around collaborative agents based on LLMs	Mr. Taeyoung Kim, CEO, AIFactory
	AI model for sound-based sleep monitoring	Dr. Daewoo Kim, Chief AI Officer, Asleep
	KDDI Views on 6G Mobile Core	Mr. Akito Suzuki, Core Researcher, KDDI Research, Inc

Invited Talk 4 : Building an AI Ecosystem around collaborative agents based on LLMs

Mr. Taeyoung Kim, CEO, AIFactory

Abstract:

As we move beyond using the knowledge and creative capabilities of Large Language Models (LLMs) like ChatGPT, research and development are underway to establish an AI ecosystem centered around LLMs. This presentation will introduce a system that leverages the remarkable performance and flexibility of LLMs for general tasks, integrating a variety of tools through collaboration with task-specific AIs to address user requests. Our approach, by integrating the strengths of specific AI with the general capabilities of LLMs, creates a more holistic, robust, and adaptable solution to meet diverse user requirements. Further, we will delve into the concept of autonomous agents that can contribute to the improvement and optimization of the system's decision-making process. These agents, working in sync with LLMs, represent the next step in our journey towards a truly intelligent and responsive AI ecosystem. Join us as we explore the future of AI, its applications, and how LLM-based agents are reshaping the landscape of AI technology.

Biography:

As a former member of the Korea Aerospace Research Institute, Mr. Taeyoung Kim founded AI Factory Inc., where he serve as CEO. Concurrently, Mr. Taeyoung Kim is a Microsoft Regional Director and an MVP. His significant research, "Solar farside magnetograms from deep learning analysis of STEREO/EUVI data," was co-first authored in Nature Astronomy. Additionally, He authored the book "Python Deep Learning with Keras alongside Blocks."

Invited Talk 5 : AI model for sound-based sleep monitoring

Dr. Daewoo Kim, Chief AI Officer, Asleep Inc.

Abstract:

With a growing interest in sleep monitoring at home, sound-based sleep staging with deep learning has emerged as a potential solution. However, collecting labeled data is restrictive in the home environments due to the inconvenience of installing medical equipment at home. To handle this, we propose novel training approaches using accessible real-world sleep sound data. Our key contributions include a new semi-supervised learning technique that considers the time-series nature of sleep sound. Our model was evaluated on various datasets including a labeled home sleep sound dataset and the public PSG-Audio dataset, demonstrating the robustness and generalizability of our model across real-world scenarios.

Industrial Sessions

Biography:

Dr. Daewoo Kim is CAIO (Chief AI Officer) in Asleep and lead the AI team. The research topics are semi-supervised learning and domain adaption for sleep monitoring and reinforcement learning for sleep improvement.

Dr. Daewoo Kim was a researcher in Waymo UK where he was mainly working on imitation learning and reinforcement learning for self-driving cars. Dr. Daewoo Kim received Ph.D. in School of Electrical Engineering at Korea Advanced Institute of Science and Technology (KAIST). During Ph.D. in LANADA lab. (LeArning in Networking: Algorithm, Design, and Analysis).

Invited Talk 6 : KDDI Views on 6G Mobile Core

Mr. Akito Suzuki, Core Researcher, KDDI Research, Inc.

Abstract:

Toward the 6G mobile network, KDDI has proposed a 6G RAN architecture, named user-centric RAN, to provide personalized radio signals for each user. Based on the promising idea of convergence between RAN and CORE networks, we are proposing the 6G mobile core system called user-centric core to cooperate with user-centric RAN, which is a highly efficient, automated, and customizable mobile network which satisfies the diverse requirements of each user/service. From the U-Plane perspective, we believe that the conventional UPF processing, which binds the forwarding process of one IP flow to one CPU core, may become a bottleneck in achieving high-capacity communication requirements in 6G, and we are studying the feasibility of a UPF acceleration method by assigning multiple CPU cores to one IP flow. Our presentation introduces the key technologies to realize them, i.e., "Full-SBA," "Lightweight," "Component," and "multi-CPU core processing UPF."

Biography:

Akito Suzuki received the B.E. and M.E. degrees in Computer Science and Communications Engineering from Waseda University, Japan, in 2017 and 2019, respectively. He joined KDDI Corp. in 2021, where he has engaged in the operation and monitoring of mobile-core facilities. Since 2020, he has been a core researcher in KDDI Research, Inc., and is now in charge of research projects of the mobile core towards 6G and SA2 standardization activities. His research interests lie in mobile network, mobile core architecture, and ultrahigh-data-rate mobile communication.

SPC Special Sessions

October 11th (Wednesday), 2023

SPC Special Session I : Next Generation Wireless Systems and Applications

08:30~10:30 | Crystal 1

Chair : Prof. JeongGil Ko (Yonsei University, Korea)

Time	Title	Invited Speakers
08:30~10:30	Building High-fidelity 3D Digital Twins over Wireless Networks	Dr. Fawad Ahmad, Assistant Professor, Rochester Institute of Technology
	Towards 6G Hyper-Connectivity: Rate-Splitting Multiple Access for Coexistence of GEO and LEO Networks	Prof. Byungju Lee, Assistant Professor, Incheon National University
	PointSplit: Towards On-device 3D Object Detection with Heterogeneous Low-power Accelerators	Prof. Hyung-Sin Kim, Assistant Professor, Seoul National University
	Channel Modeling for Joint Sensing and Communications Using Novel Ray Tracing	Mr. Tarun Chawla, Director of Business Development, Remcom Inc.

Building High-fidelity 3D Digital Twins over Wireless Networks

Dr. Fawad Ahmad, Assistant Professor, Rochester Institute of Technology

Abstract:

A live digital twin is a 3D representation of a physical object or scene that continuously replicates the object or scene in near real-time. Live digital twins have the potential to improve safety and efficiency in various fields, such as autonomous driving, construction monitoring, and disaster relief operations. However, achieving the required performance and accuracy for live digital twins is currently impossible due to limited wireless bandwidths and on-board compute resources.
This talk will discuss techniques for overcoming these limitations and building digital twins that can be used in cyber-physical systems to enable novel and exciting capabilities in fields such as autonomous driving and 3D modeling.

Biography:

Fawad Ahmad is an assistant professor in the Computer Science Department at the Rochester Institute of Technology. His research focuses on building mobile systems that enable humans, and machines likes self-driving cars, and drones to perceive, and understand the world better. He received his PhD degree from the University of Southern California in 2022. His work on autonomous driving has appeared at top-tier systems conferences like MobiSys, and NSDI.

Towards 6G Hyper-Connectivity: Rate-Splitting Multiple Access for Coexistence of GEO and LEO Networks

Prof. Byungju Lee, Assistant Professor, Incheon National University

Abstract:

The sixth generation (6G) wireless networks should be hyper-connected, implying that there are no constraints on the data rate, coverage, and computing. In this talk, we first identify the main challenges and highlight key enabling technologies for 6G hyper-connectivity. Then, we provide a coexistence scenario of GEO and LEO networks along with rate-splitting multiple access (RSMA). RSMA not only embraces the existing multiple access techniques such as orthogonal multiple access (OMA), spatial division multiple access (SDMA), and non-orthogonal multiple access (NOMA) but also provides significant performance gains by efficiently mitigating inter-user interference in a broad range of interference regimes. We conclude the talk with some open issues and future research directions for 6G hyper-connectivity.

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Biography:

Byungju Lee received B.S. and Ph.D. degrees from the School of Information and Communication, Korea University, Seoul, South Korea, in 2008 and 2014, respectively. From 2014 to 2015, he was a Post-Doctoral Fellow with the Department of Electrical and Computer Engineering, at Seoul National University, Seoul, South Korea. From 2015 to 2017, he was a Post-Doctoral Scholar with the School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, USA. From 2017 to 2020, he was a Senior Engineer with Samsung Research, Seoul, South Korea. He is currently an Assistant Professor with Department of Information and Telecommunication Engineering, Incheon National University, Incheon, South Korea. Prior to joining Incheon National University, he was a Faculty Member with Kumoh National Institute of Technology, Gumi, South Korea, from 2020 to 2022. His research interests include the physical layer system design of future wireless communications, such as integrated terrestrial and non-terrestrial networks and machine learning for wireless networks. He was awarded the 2020 Fred W. Ellersick Prize from the IEEE Communications Society co-recipient of the Bronze Prize in Samsung Best Paper Award Contest in 2018 and was announced as a Qualcomm fellowship awardee in 2010.

PointSplit: Towards On-device 3D Object Detection with Heterogeneous Low-power Accelerators

Prof. Hyung-Sin Kim, Assistant Professor, Seoul National University

Abstract:

Running deep learning models on resource-constrained edge devices has drawn significant attention due to its fast response, privacy preservation, and robust operation regardless of Internet connectivity. While these devices already cope with various intelligent tasks, the latest edge devices that are equipped with multiple types of low-power accelerators (i.e., both mobile GPU and NPU) can bring another opportunity; a task that used to be too heavy for an edge device in the single-accelerator world might become viable in the upcoming heterogeneous-accelerator world. To realize the potential in the context of 3D object detection, we identify several technical challenges and propose PointSplit, a novel 3D object detection framework for multi-accelerator edge devices that addresses the problems. Specifically, our PointSplit design includes (1) 2D semantics-aware biased point sampling, (2) parallelized 3D feature extraction, and (3) role-based group-wise quantization. We implement PointSplit on TensorFlow Lite and evaluate it on a customized hardware platform comprising both mobile GPU and EdgeTPU. Experimental results on representative RGB-D datasets, SUN RGB-D and Scannet V2, demonstrate that PointSplit on a multi-accelerator device is 24.7x faster with similar accuracy compared to the full-precision, 2D-3D fusion-based 3D detector on a GPU-only device.

Biography:

Hyung-Sin Kim is an Assistant Professor in Graduate School of Data Science at Seoul National University (SNU). He received the B.S. degree in Electrical Engineering and the M.S. and Ph.D. degrees in Electrical Engineering and Computer Science (EECS) from SNU in 2009, 2011, and 2016, respectively, all with outstanding thesis awards. He was a Postdoctoral Scholar of Computer Science at the University of California at Berkeley as a member of Real-time, Intelligent, Secure, Explainable systems (RISELab) and Building Energy Transportation Systems (BETS) group led by Prof. David E. Culler until August 2019. He was a Software Engineer at Google until February 2020. His research interest includes machine learning, systems and applications for Ambient AI and Internet of Things. He has published 69 academic papers and received Qualcomm Fellowship (2011), National Research Foundation (NRF) Global Ph.D. Fellowship (2011) and NRF Postdoctoral Fellowship (2016), and won three best paper runner-ups at SenSys, DCOSS, and WisNet.

SPC Special Sessions

Channel Modeling for Joint Sensing and Communications Using Novel Ray Tracing

Mr. Tarun Chawla, Director of Business Development, Remcom Inc.

Abstract:

Wave propagation is a physical phenomenon and modeling the channel for a wireless link is a fundamental requirement for a system. Channel models exist to assist engineers in the prediction of BER, Capacity and Throughput for wireless performance. However, standard models from legacy wireless generations are insufficient to cover the breath of new use cases, frequencies and antenna technologies for massive MIMO, 5G, 6G and beyond. Deterministic channel modeling using novel ray-tracing for digital twins can predict accurate ToF, angular spreads, band dispersion, channel latency and range doppler for 6G sensing, UWB, NTN, RIS, mobility and more.

Special care must be taken when representing this physical reality of waves using sound foundational computational electromagnetics.

Biography:

Tarun Chawla (Member, IEEE) received the B.S. degree in electrical engineering from Pennsylvania State University, in 2008. He joined Remcom, in 2009, and he is currently the Director of Business Development. His research interest includes millimeter-wave channel modeling.

SPC Special Sessions

October 11th (Wednesday), 2023

SPC Special Session II : Internet of Data

14:50~16:20 | Crystal 1

Chair : Prof. Jeongyeup Paek (Chung-Ang University, Korea)

Time	Title	Invited Speakers
14:50~16:20	Towards Highly Efficient Interactive Data-intensive Computing	Prof. Seo Jin Park, Assistant Professor, University of Southern California
	Scene Understanding beyond the Visible	Prof. Hang Qiu, Assistant Professor, University of California, Riverside
	Finding and Fixing Vulnerabilities in Blockchain Networks	Dr. Min Suk Kang, Associate Professor, KAIST

Towards Highly Efficient Interactive Data-intensive Computing

Prof. Seo Jin Park, Assistant Professor, University of Southern California

Abstract:

Traditional cluster designs were originally server-centric and have evolved recently to support hardware acceleration and storage disaggregation. In applications that leverage acceleration, the server CPU performs the role of orchestrating computation and data movement. Data-intensive applications that leverage disaggregation can be adversely affected by the increased PCIe and network bandwidth required for disaggregation. One way to cope with the challenge is a specialized cluster design for important data intensive applications, such as analytics, query processing and ML training. This design replaces servers with one or more headless smart NICs. Because smart NICs can be significantly cheaper than servers, the resulting cluster can run these applications without adversely impacting performance, while obtaining cost and energy savings.

Biography:

Seo Jin Park is an Assistant Professor in the Computer Science Department at the Univerisity of Southern California. Before joining USC, he spent a year at Google Systems Research Group. He did his postdoc at MIT CSAIL with Mohammad Alizadeh and received a Ph.D. in Computer Science from Stanford in 2019 with John Ousterhout. His research interest has been broadly in distributed systems: bringing consistency for low latency systems, improving the robustness of a blockchain protocol, optimizing consensus protocols, suppressing tail-latencies, and building efficient performance debugging tools.

Scene Understanding beyond the Visible

Prof. Hang Qiu, Assistant Professor, University of California, Riverside

Abstract:

Recent years have seen tremendous iterations on autonomous driving technologies, pushing the deployment of self-driving cars closer to its realization. As the experimental deployments scale, more challenging and less frequent corner cases surface to stress-test the reliability of the autonomous driving system. Examples of these corner cases include limited visibility due to occlusion, degraded perception at long range, transient reflection and so on. To address the limited visibility issue, in particular, cooperative perception has been proposed to leverage vehicle-to-everything (V2X) communication to share perception data with nearby vehicles to fill in the invisible area. In this talk, I will present a line of cooperative perception system research from its initial prototyping, scaling up, to its expansion from perception to end-to-end driving behaviors.

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Biography:

Hang Qiu is an assistant professor of the Department of Electrical and Computer Engineering at the University of California, Riverside. Previously, he was a postdoctoral scholar in the Platform Lab at Stanford University, a software engineer at Waymo LLC. He received his Ph.D. from the Department of Electrical and Computer Engineering at the University of Southern California and his Bachelor's degree from Shanghai Jiao Tong University. His research focus is on networked cyber-physical systems with edge ML. His work draws upon theories and methods from machine learning, wireless networking, computer vision, and robotics to build robust and cooperative intelligence in edge autonomous systems. He is a USC Annenberg Fellow, a Qualcomm Innovation Fellowship Finalist, an Outstanding Winner of COMAP ICM, a recipient of ACM Mobisys Best Paper Runner-up Award, a recipient of MLSys Outstanding Paper Award.

Finding and Fixing Vulnerabilities in Blockchain Networks

Dr. Min Suk Kang, Associate Professor, KAIST

Abstract:

Blockchain networks are distributed systems that are supposed to be secure against active attacks. In this talk, I will present our recent work on finding and fixing vulnerabilities in blockchain networks. First, I will present our Bitcoin partitioning attack, called the Erebus attack. The Erebus attack partitions the Bitcoin network without any routing manipulations, making the attack undetectable to control-plane and even to data-plane detectors. I will discuss how we have been collaborating with the Bitcoin Core team to address this attack and introduce a remaining open problem. In the second part of the talk, I will present our recent attack, called the Gethlighting attack, that partitions target Ethereum nodes from their mainnet without directly occupying target's peer connections. This subtle denial-of-service vulnerability enables an adversary to prevent a target Ethereum node from accepting new blocks for hours, causing effective partitioning attacks. I will end the talk with a brief discussion on the future research directions in blockchain network security.

Biography:

Min Suk is an Associate Professor, School of Computing at KAIST since September 2023. Prior to joining KAIST in 2020, Min Suk had been an Assistant Professor of Computer Science Department, School of Computing at National University of Singapore since 2016. His research interests lie in the field of network and distributed systems security, blockchain security, and wireless network security. He obtained his PhD degree in Electrical and Computer Engineering from Carnegie Mellon University in 2016 under the supervision of Virgil D. Gligor in CyLab. He received BS and MS degrees in EECS at Korea Advanced Institute of Science and Technology (KAIST) in 2006 and 2008, respectively.

SPC Special Sessions

October 12th (Thursday), 2023

SPC Special Session III : Mobile Systems and Applications

08:30~10:00 | Crystal 1

Chair : Prof. Sangeun Oh (Ajou University, Korea)

Time	Title	Invited Speakers
08:30~10:00	Systems Support for Visual SLAM	Dr. Steve Ko, Associate Professor, Simon Fraser University
	MixMax: Leveraging Heterogeneous Batteries to Alleviate Low Battery Experience for Mobile Users	Prof. Jinkyu Lee, Associate Professor, Sungkyunkwan University
	Performance Estimation after Personalization for Heterogeneous Mobile AI Applications	Dr. Taesik Gong, Research Scientist, Nokia Bell Labs

Systems Support for Visual SLAM

Dr. Steve Ko, Associate Professor, Simon Fraser University

Abstract:

This talk will discuss our effort on optimizing visual SLAM (Simultaneous Localization and Mapping) so it can comfortably run on a small device such as smartphones and AR/VR headsets. SLAM systems estimate the state and trajectory of a mobile agent (e.g., a human, a robot, or a vehicle) while also building a map of the environment using onboard sensors such as cameras and LiDARs. Visual SLAM systems achieve this by identifying and tracking incoming color or depth images. However, visual SLAM algorithms are known to be resource-intensive and difficult to run on small devices. As a result, the current practice is to not run a full-scale visual SLAM algorithm but to run a partial algorithm with limited functionality in order to reduce the resource demand of a full-scale algorithm. Due to this reason, SLAM systems are not fully realizing their potential for enabling a wider variety of applications. To improve this status quo, we have been investigating optimization techniques to make full-scale on-device visual SLAM feasible. Our goal is to concretely explore optimization techniques and trade-offs in terms of accuracy, resource consumption, and latency.

Biography:

Steve Ko is an Associate Professor in the School of Computing Science at Simon Fraser University. His current research interest is improving the reliability and security of mobile systems by developing techniques at the intersection of mobile systems and software engineering. He received a B.S. degree in Mathematics from Yonsei University, an MS in Computer Science and Engineering from Seoul National University, and a PhD in Computer Science from the University of Illinois at Urbana-Champaign. He worked as a postdoc in the Department of Computer Science at Princeton University. Until 2020, He was with the Department of Computer Science and Engineering at the University at Buffalo, The State University of New York as an Associate Professor.

MixMax: Leveraging Heterogeneous Batteries to Alleviate Low Battery Experience for Mobile Users

Prof. Jinkyu Lee, Associate Professor, Sungkyunkwan University

Abstract:

Despite the physical advance of an existing single-cell battery system, mobile users are still suffering from low battery anxiety. With a careful analysis of users' battery usage behavior collected for 19,855 hours, we propose a heterogeneous battery system, MixMax, consisting of three complementary battery types tailored to minimizing the low battery time. While composing a heterogeneous battery system opens up a chance to simultaneously improve the capacity and the charging speed, one must

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face non-trivial challenges to determine the ratio of enclosed batteries and charge/discharge policies during the run-time. They are highly dependent on each other, which entails almost infinite candidates for the choice. MixMax gracefully unwinds the dependencies as it formulates the decision-making problem into an optimization problem and decomposes it into multiple sub-problems instead. To evaluate MixMax, we fabricate coin-cell batteries and experiment with them to model an accurate battery emulator which sophisticatedly reproduces the dynamics of battery systems. Our experimental results demonstrate that MixMax can reduce the low battery time by up to 24.6% without compromising capacity, volume, weight, and more importantly, users' battery usage behavior. In addition, we prototype MixMax on a smartphone, presenting the practicality of MixMax on mobile systems.

Biography:
Jinkyu Lee received the BS, MS, and PhD degrees in computer science from the Korea Advanced Institute of Science and Technology, Republic of Korea, in 2004, 2006, and 2011, respectively. He is currently an associate professor with Department of Computer Science and Engineering, Sungkyunkwan University, Republic of Korea, where he joined in 2014. From 2011 to 2014, he was a research fellow with the Department of Electrical Engineering and Computer Science, University of Michigan, USA. His research interests include system design and analysis with timing guarantees, QoS support, and resource management in real-time embedded systems, mobile systems, and cyber-physical systems. He was the recipient of Best Student Paper Award from 17th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) in 2011 and Best Paper Award from 33rd IEEE Real-Time Systems Symposium(RTSS) in 2012.

Performance Estimation after Personalization for Heterogeneous Mobile AI Applications

Dr. Taesik Gong, Research Scientist, Nokia Bell Labs

Abstract:
Many applications utilize sensors in mobile devices and machine learning to provide novel services. However, various factors such as different users, devices, and environments impact the performance of such applications, thus making the domain shift (i.e., distributional shift between the training domain and the target domain) a critical issue in mobile sensing. Despite attempts in domain adaptation to solve this challenging problem, their performance is unreliable due to the complex interplay among diverse factors. In principle, the performance uncertainty can be identified and redeemed by performance validation with ground-truth labels. However, it is infeasible for every user to collect high-quality, sufficient labeled data. To address the issue, we present DAPPER (Domain AdaPtation Performance EstimatoR) that estimates the adaptation performance in a target domain with only unlabeled target data. Our key idea is to approximate the model performance based on the mutual information between the model inputs and corresponding outputs. Our evaluation with four real-world sensing datasets compared against six baselines shows that on average, DAPPER outperforms the state-of-the-art baseline by 39.8% in estimation accuracy. Moreover, our on-device experiment shows that DAPPER achieves up to 396x less computation overhead compared with the baselines.

Biography:
Dr. Taesik Gong is a Research Scientist at Nokia Bell Labs, Cambridge, UK. His research focuses on algorithmic & systematic research for efficient on-device machine learning. He received his Ph.D. and M.S. in Computer Science from KAIST under the supervision of Prof. Sung-Ju Lee. He received his B.S. in Computer Science from Yonsei University with Summa Cum Laude. His research interests are at the intersection of machine learning and mobile computing. He has published his work in prestigious machine and mobile computing venues, such as NeurIPS, SenSys, and UbiComp. During his Ph.D., he did research internships at Nokia Bell Labs, Google Research, and Microsoft Research. He has received several awards, including the Google Ph.D. Fellowship in Machine Learning, NAVER Ph.D. Fellowship, and Best Ph.D. Dissertation Award from both the School of Computing and the College of Engineering at KAIST.

SPC Special Sessions

October 12th (Thursday), 2023

SPC Special Session IV : Software, Software, Software!

13:00~14:30 | Crystal 1

Chair : Prof. Youn Kyu Lee (Hongik University, Korea)

Time	Title	Invited Speakers
13:00~14:30	Software Analysis Practice for ICT Intellectual Property Litigation	Dr. Jae Young Bang, Director of Software Development, Quandary Peak Research
	Research on Automating Security Validation for RMF Standard Implementation	Prof. Dohoon Kim, Assistant Professor, Kyonggi University
	Homomorphic computation on ciphertexts	Dr. Changmin Lee, KIAS Fellow (Assistant Professor), KIAS (Korea Institute for Advanced Study)

Software Analysis Practice for ICT Intellectual Property Litigation

Dr. Jae Young Bang, Director of Software Development, Quandary Peak Research

Abstract:
I will discuss the roles and responsibilities of a software expert witness in high-stakes ICT intellectual property lawsuits in North America regarding patent infringement, copyright infringement, class action, etc. I will share my real-world experience working with trial attorneys and analyzing technical evidence in lawsuits from software patents, catastrophic software failures, theft of trade secrets, and other matters.

Biography:
Dr. Jae Young Bang is the director of software development and a senior computer scientist at Quandary Peak Research with over a decade of experience in software engineering. His background ranges from academic research in software architecture to leading-edge software development practice.
Dr. Bang currently serves as a testifying expert in software-related litigation, including patent/copyright infringement and breach-of-contract matters. His role includes researching software architecture design and analysis. He also teaches Software Design at the University of California, Irvine.

Research on Automating Security Validation for RMF Standard Implementation

Prof. Dohoon Kim, Assistant Professor, Kyonggi University

Abstract:
This study primarily focuses on introducing the Risk Management Framework (RMF), currently being implemented in the integrated security management system of the US Department of Defense (DoD), and creating a K-RMF that is tailored to the domestic context. In particular, throughout this process, various cyber threat modeling techniques are utilized, based on the MITRE framework's Tactics, Techniques, and Procedures (TTPs), to develop ATTACK TREE and DEFEND TREE methodologies.
The objective of this research is to provide an overview of the process of conducting proactive cyber-based risk assessment by leveraging various open-source tools and frameworks, specifically focusing on automating it using the OPEN RMF approach. By adopting the OPEN RMF, the study aims to develop a comprehensive understanding of the risk assessment process in the context of cybersecurity. This involves utilizing open-source resources to enhance the efficiency and effectiveness of risk assessment activities, enabling a more dynamic and adaptive approach to managing cyber risks.

SPC Special Sessions

Biography:

2018 ~ : KYONGGI UNIVERSITY, SUWON, KOREA / Assistant Professor
2012 – 2018: AGENCY FOR DEFENSE DEVELOPMENT DAEJEON, KOREA / Senior Researcher at Cyber & Information Security Division
Research Topic: Malware & Big-Data Analysis, CERT, Reversing, Digital Forensic.
Ongoing Project
1) 2023: Analysis of space cybersecurity policies (PM)
2) 2022 – 2023: (PM) Future challenging defense technology - Development of cyber warfare automatic deception technology Defense Acquisition Program Administration
3) 2023 ~ 2025: (PM) A Study on the Hybrid M&S Based Permissioned Blockchain Resilience for Digital Twin Transformation / NRF
DOHOON KIM received the B.S. degree in mathematics and computer science from Korea University, in 2005, and the M.S degree in information security and computer science from Korea University, in 2007, and the Ph.D. degree in information security and computer science (with specialization in cybersecurity and network security) from Korea University, in 2012. From 2012 to 2018, he was a Senior Research Engineer with the Agency for Defense Development (ADD), Daejeon-si, South Korea.
He is currently a Assistant Professor with the Department of Computer Science, Kyonggi University, Suwon, South Korea, since 2018. His areas of research include cybersecurity, botnet, risk analysis, cyber deception,and moving target defense (MTD).

Homomorphic computation on ciphertexts

Dr. Changmin Lee, Assistant Professor, Korea Institute for Advanced Study

Abstract:

After the advent of Iot, cloud computing, and big data, outsourcing computation to untrusted servers without sacrificing privacy of sensitive data has received a lot of attention.
As the solutions, two frame works are suggested: Homomorphic encryption and Functional encryption. Both schemes enable to compute on ciphertexts while privacy preserving. In this talk, I will present basic notions of two schemes including definitions, algorithm, underlying security and its related issues in mathematician's view.

Biography:

2012~2017& Ph.D. in Mathematical Science, Seoul National University, Korea.
Advisor: Prof. Jung Hee Cheon
2017.09~2018.09& Postdoctoral researcher, The Research Institute of Basic Sciences, Seoul National University, Korea.
2018.10.~2020.09& Labex Milyon Postdoctoral researcher, ENS de Lyon, France
Advisor: Prof. Damien Stehle
2020.10.~Now& KIAS Fellow (KIAS Assistant Professor), KIAS, Korea

SPC Special Sessions

October 13th (Friday), 2023

SPC Special Session V : Web 3.0

08:30~10:00 | Crystal 1

Chair : Prof. Hoon Lee (UNIST, Korea)

Time	Title	Invited Speakers
08:30~10:00	Towards Trustworthy Decentralized Web 3.0	Dr. Gyu Myoung Lee, Professor, Liverpool John Moores University
	Trust Management for Web3.0	Dr. Tai-Won Um, Associate Professor, Chonnam National University
	DAO (Decentralized Autonomous Organization): Organization of Web3	Mr. Hang Jin Kim, Director, LiberVance

Towards Trustworthy Decentralized Web 3.0

Dr. Gyu Myoung Lee, Professor, Liverpool John Moores University

Abstract:
IoT and data are becoming essential to support AI-based solutions with the immersiveness of spatial computing. Blockchain, as a machine for creating trust, is revolutionizing the way transactions. In this context, this talk introduces key concepts, features and characteristics of the new Internet, the so-called Web 3.0, and its vision as the Internet of Value, connecting people, machines and AI to transform the world. Starting from the new economic paradigm for cyberspaces, the data ecosystem and its characteristics, this talk presents key challenges for realizing the decentralized platform with trust technology and discusses next steps for future research.

Biography:
Prof. Gyu Myoung Lee is with the Liverpool John Moores University (LJMU), UK, as a Professor and with KAIST Institute for IT convergence, Korea, as an Adjunct Professor. Prior to joining the LJMU, he has worked with the Institut Mines-Telecom, Telecom SudParis, France, from 2008. Until 2012, he had been invited to work with the Electronics and Telecommunications Research Institute (ETRI), Korea. He also worked as a research professor in KAIST, Korea and as a guest researcher in National Institute of Standards and Technology (NIST), USA, in 2007. His research interests include Internet of things, data analytics, computational trust, knowledge centric networking and services, multimedia services, and energy saving technologies including smart grids. He has been actively involved in standardization in ITU-T, IETF and oneM2M, etc., and currently serves as a WP chair in SG13, a vice-chair of Focus Group on Autonomous Networks (FG-AN), a Rapporteur of Q16/13 and Q4/20 as well as an Editor in ITU-T. He was also the chair of ITU-T Focus Group on data processing and management (FG-DPM) to support IoT and smart cities & communities. He was awarded the Vice-Chancellor's Award for excellence in research in 2017 and was also awarded the Best Paper Awards in ICIN'2017, WF-IoT'2014, etc. He is a Senior Member of IEEE.

SPC Special Sessions

Trust Management for Web3.0

Dr. Tai-Won Um, Associate Professor, Chonnam National University

Abstract:
This presentation introduces trust management technologies for Web 3.0. It analyzes the trust requirements to support a reliable Web 3.0 economy, including data sharing and digital asset transactions, and explores the limitations of existing technologies such as blockchain, NFTs, metaverses, and AI, and how trust can be embedded in Web 3.0.

Biography:
- 2022.03 ~ Present: Associate Professor, Graduate School of Data Science, Chonnam National University
- 2020.03 ~ 2022.02: Assistant Professor, College of Science and Technology, Duksung Women's University
- 2017.09 ~ 2020.03: Associate Professor, Department of Information and Communication Engineering, Chosun University
- 2006.02 ~ 2017.08: Principal Researcher, Electronics and Telecommunications Research Institute(ETRI)

DAO (Decentralized Autonomous Organization): Organization of Web3

Mr. Hang Jin Kim, Director, LiberVance

Abstract:
As the most important part to be improved in the transition from Web2 to Web3, how to improve the severity of the centralization problem of platform companies that have secured a monopoly position, and as an alternative to it, DAO as a blockchain-based decentralized organizational structure Consider examples of how they can be used and what problems to solve.

Biography:
Focused Research Area : Blockchain , Web3 , Blockchain AI conversence , Blockain SmartCity techs conversence
Work Profie (Lastest 5 year in Total 28 year)
2021 ~ MckinleyRice Co.,Ltd CSO , Blockchain X
2019~2021 *CityLabs , Chief Dricector of SmartCity Biz Unit
2017~2019 ** Iconloof , Director , Government Relation

* Listed company : Kosdaq ** Listed company in Crypto : Binance

SPC Special Sessions

October 13th (Friday), 2023

SPC Special Session VI : Future Networks

10:20~11:50 | Crystal 1

Chair : Prof. Heejun Roh (Korea University, Korea)

Time	Title	Invited Speakers
10:20~11:50	Heterogeneous CSMA for Improved Energy Fairness in LoRaWAN	Prof. Chenglong Shao, Assistant Professor, Kyushu Institute of Technology
	Network Switches as Domain-Specific Hardware for Distributed Storage	Prof. Gyuyeong Kim, Assistant Professor, Sungshin Women's University
	Learning to Optimize MIMO Networks	Prof. Hoon Lee, Associate Professor, UNIST

Heterogeneous CSMA for Improved Energy Fairness in LoRaWAN

Prof. Chenglong Shao, Assistant Professor, Kyushu Institute of Technology

Abstract:

TIn this talk, I present a heterogeneous carrier-sense multiple access (CSMA) protocol named LoHEC to improve energy fairness during channel access in CSMA-based long-range wide area network (LoRaWAN). LoHEC is enabled by Channel Activity Detection(CAD), a recently introduced carrier-sensing technique for detecting LoRaWAN signals even below the noise floor. The design of LoHEC is inspired by the fact that existing CAD-based CSMA protocols operate in a homogeneous manner by having LoRaWAN end devices perform identical CAD regardless of the differences in their used network parameter - spreading factor (SF). This can lead to an energy consumption unbalance among end devices since the consumed energy during CAD is significantly affected by SF. By considering the heterogeneity of LoRaWAN in terms of SF, LoHEC requires end devices to perform different numbers of CADs with different CAD intervals during channel access. The needed CADs and CAD interval are determined based on the CAD energy consumption under different SFs. Experimental results show that LoHEC can significantly improve the energy fairness compared with the existing solutions.

Biography:

Chenglong Shao is an Assistant Professor in the Department of Computer Science and Networks at Kyushu Institute of Technology, Iizuka, Japan. He received his B.S. degree in information and communications engineering at Xi'an Jiaotong University, Xi'an, China, in 2010. He received his Ph.D. degree in computer science and engineering at Korea University, Seoul, Republic of Korea, in 2019. He worked as a Research Professor at Korea University in 2019 and a JSPS International Research Fellow at Kyushu University from 2021 to 2023. His research interests include wireless communications and networking, mobile computing for the Internet of Things, wireless security, and networked embedded systems.

SPC Special Sessions

Network Switches as Domain-Specific Hardware for Distributed Storage

Prof. Gyuyeong Kim, Assistant Professor, Sungshin Women's University

Abstract:
In-network computing is an emerging paradigm that offloads server functionality into the network switch by leveraging the capability of programmable switches for high throughput and low latency. In this talk, I show that network switches can be domain-specific hardware for distributed storage supported by key-value stores. First, I present NetLR, an in-network replication coordinator, which can perform data replication in the switch directly to achieve high performance and strong consistency. Next, I introduce NetStore, a holistic in-network storage accelerator that mitigates performance overhead caused by large requests by co-designing the switch control plane and the switch data plane. Lastly, I present NetClone, an in-network dynamic request cloning mechanism to mask the service-time variability of modern servers. By dynamically cloning requests and blocking slower responses in the switch, NetClone achieves high performance for microsecond-scale workloads.

Biography:
Gyuyeong Kim is an assistant professor at the Department of Computer Engineering, Sungshin Women's University, Seoul, South Korea. He received his B.S. and Ph.D. degrees in computer science from Korea University in 2012 and 2020, respectively.
His research interests include networked systems, in-network computing, and network stack.

Learning to Optimize MIMO Networks

Prof. Hoon Lee, Associate Professor, UNIST

Abstract:
MIMO techniques have been regarded as promising solutions for enhancing spectral efficiency of the future wireless communication networks. The optimization of MIMO networks involves a joint design of multi-antenna signal processing, channel estimation and acquisition processes. This requests computationally expensive nonconvex optimization algorithms with suboptimal performance, especially in large-scale MIMO networks. To tackle these challenges, there have been intensive studies on machine learning approaches for MIMO communication networks. This talk presents an overview of recent machine learning-based MIMO system designs. Technical challenges of existing algorithms and open research opportunities are discussed.

Biography:
Hoon Lee received the B.S. and Ph.D. degrees from Korea University, Seoul, Korea, in 2012 and 2017, respectively. Since 2019, he has been with the Department of Information and Communications Engineering, Pukyong National University, Busan, Korea. His research interests include machine learning, signal processing, and optimization for wireless communications.

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SCSS 2023 Program at a Glance		
October 12th (Thursday)		
Time	Program	Moderator
08:30~10:00	**Technical Session – I (Communications)**	Session Chair: Howon Lee (Hankyong National University)
08:30~09:00	**Invited Talk 1: Challenges in 6G Multi-Satellite Connectivity**	Dr. Jorge Querol (University of Luxembourg)
09:00~09:15	(Invited Paper) 1-1: On Architecting LEO Mega-Constellation Networks	Jihwan P. Choi (KAIST)
09:15~09:30	Paper 1-2: An Adaptive Frame-based Age-aware Access Scheme for Time-critical Satellite-IoT	Huiyang Zie, Zhengyu Cao, Shilun Song, Sang-Woon Jeon, and Hu Jin (Hanyang University)
09:30~09:45	Paper 1-3: Space-Time Block Code Based Cooperative Physical Layer Security Schemes for LEO Satellite Systems	Heyin Lee and Sooyoung Kim (Jeonbuk National University)
09:45~10:00	Paper 1-4: Spectrum Sharing Method in Satellite and Terrestrial Coexisting Networks	Hyunwoo Jung and Jung-Bin Kim (ETRI)
10:00~10:20	Coffee Break	
10:20~11:50	**Opening Ceremony, Keynotes**	Session Chair: Bang Chul Jung (Chungnam National University)
10:20~10:30	Welcome Address	Moon-Sik Lee (ETRI)
	Congratulatory Address	Woohyuk Choi (Ministry of Science and ICT, Korea Government)
10:30~10:50	**Special Talk: The Strategies to Revitalize the Satellite Communication in Korea**	Woohyuk Choi (Ministry of Science and ICT, Korea Government)
10:50~11:20	**Keynote I: Towards 6G Non-Terrestrial Networks – A Perspective from Internet of Things Use-Cases**	Dr. Joan A. Ruiz-de-Azua (Director of Space Communications Research Group, i2CAT Foundation)
11:20~11:50	**Keynote II: Satellite Communication Technology and Future**	Prof. Jae-Hyun Kim (Ajou University)
11:50~13:00	Lunch	
13:00~14:30	**Poster Session (P6)**	Session Chair: Heejung Yu (Korea University)
13:00~14:30	**Technical Session – II (Navigation & Satellite Systems)**	Session Chair: Jeongho Kwak (DGIST)
13:00~13:25	**Invited Talk 2-1: GNSS Error Correction Techniques for Position Accuracy Enhancement**	Prof. Seongkyun Jeong (Sangmyung University)
13:25~13:50	**Invited Talk 2-2: Reflectarray Antenna Technology for LEO Satellite Communication System**	Prof. Seongmin Pyo (Hanbat National University)
13:50~14:05	(Invited Paper) 2-1: Metamaterial Lensing Surface for A Weight-reduced Metal Waveguide Antenna on Satellites	Sungtek Kahng, Jaewon Koh, Yejune Seo, Woogon Kim, Inyeol Moon, and Seongbu Seo (Incheon National University)
14:05~14:20	Paper 2-2: A Novel Correlative Interferometer Technique with Multi-sample Diversity for Finding Direction of Satellites	Young-Seok Lee, Minkyu Oh, InKi Lee*, and Bang Chul Jung (Chungnam National University & ETRI*)
14:20~14:30	Paper 2-3: Linear Subarrays for Multi-beam Satellites	Sangbae Oh*, Jungjin Shin*, Hyojoon Lim*, Joongki Park*, Heedong Do, Namyoon Lee (LIG Nex1* & Korea University)
14:30~15:00	Coffee Break	

※ The Poster sessions will take place in the corridor outside the Oral Session Room.

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October 12th (Thursday), 2023

ICTC Workshop on SCSS (IWSCSS) 1 - Invited Talk 1

08:30~09:00 | Emerald

Chair: Prof. Howon Lee (Hankyong Nat'l University, Korea)

Challenges in 6G Multi-Satellite Connectivity

Dr. Jorge Querol, (University of Luxembourg)

Abstract:
Future 6G communications networks will natively embed a 3D architecture via multi-satellite downlinks with users receiving signals from numerous multi-band satellites in the same or different orbits. This talk is a journey through the existing and future concepts, technologies, trade-offs and challenges associated to satellite Multi-Connectivity (MC). Existing architectures and technologies for multi-link connectivity for both terrestrial and satellite in the current state-of-the-art are considered, including those in 3GPP standardization such as Dual-Connectivity (DC), Carrier Aggregation (CA), Multi-Transmission and Reception Point (multi-TRP). Potential MC scenarios in which the UE receives multiple signals simultaneously are discussed as well as their antenna challenges and timing requirements. Several KPIs are defined to allow for a fair comparison of the MC techniques, with a special emphasis on the user plane connectivity. Different configurations and network layouts are considered, including functional split options, MC user plane architectures and MC scenarios. The feasibility and suitability of the MC approaches with different scenarios are traded-off in a compatibility matrix. Furthermore, case studies are presented as real examples of the various MC trade-offs and how they can be utilized to improve the overall system performance.

Biography:
Jorge Querol is Research Scientist and Head of the 6GSPACE lab at the SIGCOM Research Group of the Interdisciplinary Center for Security, Reliability and Trust (SnT) at University of Luxembourg. He received the Ph.D. degree (Cum Laude) in signal processing and communications from the Polytechnic University of Catalonia, Barcelona, Spain, in 2018. Since then, he is the principal investigator and project manager of multiple research projects dealing with AI-accelerated satellite communications, real-time signal processing, 5G non-terrestrial networks, software defined radio transceivers, joint 6G & satellite navigation, and remote sensing platforms. He is also leading the development of 6G-oriented space and satellite communications experimental and interdisciplinary testbeds for high-TRL and industry-driven applications.

ICTC Workshop on SCSS (IWSCSS) 2 - Keynote I

10:30~11:10 | Emerald

Chair: Prof. Bang Chul Jung (Chungnam Nat'l University, Korea)

Towards 6G Non-Terrestrial Networks – A Perspective from Internet of Things Use-Cases

Dr. Joan A. Ruiz-de-Azua, Director of Space Communications Research Group, i2CAT Foundation

Abstract:
Satellite systems have evolved from governmental or space agencies monolithic missions to novel and disruptive (public and private) initiatives. These novel distributed architectures emerged to satisfy current and future environmental, socio-economic and geo-political demands. Satellite constellations are an example of these distributed architectures in which all the satellites work in a coordinated manner for common mission goals. The usage of these constellations for broadband and narrowband communications services have been investigated in the last decades. This interest has been accentuated with the definition of 6G. Although large discussions are still ongoing to properly define what 6G aims to address, some entities and researchers have presented their visions. For instance, the 5G-IA presented a vision emphasizing the intelligent connection between heterogeneous systems and networks, flexible and affordable solutions, trustworthy infrastructure, and deterministic end-to-end services. In this

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vision, satellite systems play a relevant role thanks to its in-orbit characteristics, which contribute to achieve ubiquitous service, seamless coverage, and servicing ultra-high density areas. The previous solutions on satellite communications differ to this vision due to the usage of ad-hoc and non-standardized technologies. Therefore, further research and discussions need to be performed to integrate satellite systems in the cellular ecosystem and standardization process.

Biography:

PhD. Joan A. Ruiz-de-Azua (IEEE Member) was born in Barcelona, Spain. He received the degree in aerospace engineering from Supaero (France) and the degree in telecommunications engineering from UPC (Spain) in 2015. He was awarded with the best Master's thesis on Critical Communications from the Official Spanish Telecommunications Chartered Institute in 2016. Additionally, he received the Ph.D. degree of telecommunications engineering from the UPC (Spain) in 2020. This dissertation contributes to the Internet of Satellites paradigm in which satellites from different stakeholders establish temporal and opportunistic Inter-Satellite Networks because remote satellites want to collaborate between them. He was awarded with the Cum Laude mention for the excellence of his Ph.D. dissertation. He has participated in different aerospace projects, such as the development of Ariane 5 and Ariane 6 ground segment in GTD company. Furthermore, he has participated in five CubeSat missions in the five years, specially remarking the FSSCat mission (winner of the Copernicus Masters competition, and the Sentinel Small Satellite challenge). In this mission, he was responsible for the FSS Experiment payload. Furthermore, he has been the co-advisor of more than 13 Bachelor's and 8 Master's degree dissertations, and 4 PhD students. He has published 18 works in conferences, 16 in journals and 2 book chapters. Currently, he participating in the European SNS JU ETHER project (https://www.ether-project.eu/) and technically leading the national UNICO-5G 6GSatNet project (https://i2cat.net/unico/6gsatnet/). Additionally, he is leading the research on satellite communications in the NewSpace strategy of the Catalan Government. He is the director of the Space Communication Research Group, which aims at contributing to developing novel communications technologies for future Earth Observation and Telecommunications satellite missions. His research interests are linked to satellite networks, non-terrestrial network architectures, disruptive tolerant routing protocols, application of artificial intelligence in satellite communications, integration of SDN/NFV in satellite constellations, and the integration of IoT devices with satellite platforms.

ICTC Workshop on SCSS (IWSCSS) 2 - Keynote II

11:10~11:50 | Emerald

Chair: Prof. Bang Chul Jung (Chungnam Nat'l University, Korea)

Satellite Communication Technology and Future

Prof. Jae-Hyun Kim, Ajou University

Abstract:

Satellite communication is one of the key researches in next-generation wireless networks. This presentation will explain domestic and international trends and technologies in satellite communication. This talk will focus on LEO satellite communication technologies and 3GPP Standard NTN. We will also propose directions for the development of satellite communication services and satellite information utilization services.

Biography:

Jae-Hyun Kim (Member, IEEE) received the B.S., M.S., and Ph.D. degrees in computer science and engineering from Hanyang University, Ansan, South Korea, in 1991, 1993, and 1996, respectively. In 1996, he was with the Communication Research Laboratory, Tokyo, Japan, as a Visiting Scholar. From April 1997 to October 1998, he was a Postdoctoral Fellow with the Department of Electrical Engineering, University of California at Los Angeles. From November 1998 to February 2003, he was a member of Technical Staff with the Performance Modeling and QoS Management Department, Bell Laboratories, Lucent Technologies, Holmdel, NJ, USA. Since 2003, he has been with the Department of Electrical and Computer Engineering, Ajou University, Suwon, South Korea, as a Professor. His research interests include medium access control protocols, QoS issues, cross layer optimization for wireless communication, satellite communication, and mobile data offloading. He is currently the Center Chief of the Satellite Information Convergence Application Services Research Center (SICAS) sponsored by the Institute for

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Information and Communications Technology Promotion, South Korea. He has been the Chairman of the Smart City Committee of 5G Forum in South Korea, since 2018. He is the Vice Chairman of the Korea Institute of Communication and Information Sciences (KICS). He is a member of the KICS, the Institute of Electronics and Information Engineers, and the Korea Information Science Society.

ICTC Workshop on SCSS (IWSCSS) 3 - Invited Talk 2-1

13:00~13:25 | Emerald

Chair: Prof. Jeongho Kwak (Daegu Gyeongbuk Institute of Science and Technology, Korea)

GNSS Error Correction Techniques for Position Accuracy Enhancement

Prof. Seongkyun Jeong, Sangmyung University

Abstract:
GNSS(Global Navigation Satellite System) is a convenient system that can obtain position and time information anywhere it can receive signals from navigation satellites worldwide. GNSS is widely used in many application systems that require position information due to the advantage that public can easily acquire position information without any special restrictions if they are in areas where navigation signals reach. Despite this convenience, navigation signals have low signal strength and contain errors as they pass through the Earth's atmosphere. In addition, it is difficult to calculate precise position due to various errors such as satellite orbit error, clock error and multi-path error. Therefore, its use is bound to be limited in aviation fields, smart grid, port facilities, geodetic surveying, etc. that require a precise position accuracy. To compensate for these limitations, various GNSS error correction technologies have been developed and are in operation. These error correction methods include techniques based on code measurements and carrier measurements. The application method and position accuracy of the techniques are dependent on the characteristics of each measurement. This presentation will cover the types and characteristics of error correction techniques applied to improve position accuracy.

Biography:
Seongkyun Jeong is Associate professor of department of human intelligence robot engineering at Sangmyung University, Korea. He received the Ph.D. degree from department of aerospace engineering at Korea Advanced Institute of Science and Technology, Korea, in 2010. He received the master's degree from the department of mechanical and aerospace engineering at Seoul National University, Korea, in 2005 and the bachelor's degree from the department of mechanical and aerospace engineering at Seoul National University, Korea, in 2003. He worked as a senior researcher at the Electronics and Telecommunications Research Institute, Korea, from 2005 to 2016, where he conducted satellite and navigation-related research. He worked on establishing national space policy as a deputy director at the Ministry of Science and ICT from 2016 to 2020. He has been conducting research related to navigation and flight robot at Sangmyung University since 2020.

ICTC Workshop on SCSS (IWSCSS) 3 - Invited Talk 2-2

13:00~13:25 | Emerald

Chair: Prof. Jeongho Kwak (Daegu Gyeongbuk Institute of Science and Technology, Korea)

Reflectarray Antenna Technology for LEO Satellite Communication System

Prof. Seongmin Pyo, Hanbat National University

Abstract:
In the New Space era, low Earth orbit (LEO) satellites constellation becomes a core technology for hyper-connected communication systems in both vertical and horizontal space and time. The previous application of conventional single satellite is only used by a communication relay between of gate-ways on the Earth and Earth exploration that receive information from the

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Earth and transmit the obtained information to a ground station. However, LEO satellites constellation at a speed of 8 km/h with various orbits can be used for new goal such as the internet of space and space to space and space to ground communication networks in addition to these classic purposes. For these LEO satellites constellation, a beamforming antenna system is essential to use communication networks between satellites and between satellites and earth stations. The existing beam steering system using physical satellite attitude control has the disadvantage of making it difficult to steer the beam at high speed. Therefore, numerous satellite constellations moving at high speeds in different orbits require accurate beam steering antenna systems for satellites and ground stations. In this invited talk, we will discuss the development direction of antenna technology suitable for the physical limitations of LEO satellite constellations and the advantages of reflectarray technology. We will review the parabolic reflector antenna typically used in satellite communications, the phased array-based beamforming antenna, and finally the pros and cons of reflectarray antennas and future trends in reflectarray technology for multiple beamforming antenna system.

Biography:

Professor Seongmin Pyo is faculty of Department of Information and Communication Engineering at Hanbat National University. He received the B.S., M.S., Ph.D. degree in radio science and engineering from the Korea University, Seoul, Korea, in 2002, 2004 and 2011, respectively. From 2011 to 2013, he is the senior researcher of Electronics and Telecommunications Research Institute (ETRI) and Agency for Defense Development (ADD) for wireless RF front end and beamforming antenna system for high-speed moving vehicle platforms with from UHF to THz spectrum band. Since he joined the Department of Information and Communication Engineering at Hanbat National University in February 2013, he has been focusing on beamforming antenna system such as phased-array based analog, digital and hybrid beamforming antenna and reflectarray antennas for high-speed mobile vehicle such as electric car, unmanned aerial vehicle and LEO satellites. He is currently the principal investigator of the National Defense Laboratory Group Project entitled that Space Intelligent Communication Network supported by Korea Research Institute for Defense Technology Planning and Advancement (KRIT) grant funded by Defense Acquisition Program Administration (DAPA).

Technical Paper Sessions

October 11th (Wednesday), 2023

[Session A1] Machine Learning 1

Oct. 11, 08:30~10:30

Chair : Dr. Cosmas Ifeanyi Nwakanma (Kumoh Nat'l Institute of Technology, Korea)

Session A1-1 MINSU: Precision Quantity Counter with DNN-based Volume Estimation
Shubhangi Saileja Rabichandra Garnaik (SUNY Korea, Korea (South)); Dong Yeop Lee (State University of New York, Korea (South)); Youngho Kim (State University of New York, Korea, Korea (South)); Jihoon Ryoo (SUNY Korea, Korea (South))

Session A1-2 Optimally Spaced Autoencoder
Cheng-Yuan Liou and Daw-Chih Liou (National Taiwan University, Taiwan)

Session A1-3 An Optimal Re-parametrization Scheme for Generalization in Reinforcement Learning
Ivan Dzeuban Fenyom, Oladayo Ajani and Rammohan Mallipeddi (Kyungpook National University, Korea (South))

Session A1-4 Optimizing Anomaly Detection in Large-scale Logs
Arnatchai Techaviseschai and Sansiri Tarnpradab (King Mongkut's University of Technology Thonburi, Thailand); Vasco Barroso (European Organization for Nuclear Research (CERN), Switzerland); Phond Phunchongharn (King Mongkut's University of Technology Thonburi, Thailand)

Session A1-5 Transfer Learning in Brain Tumor Classification: Challenges, Opportunities, and Future Prospects
Raja Waseen Anwar (German University of Technology, Oman); Mohammad Abrar (Arab Open University Oman, Oman); Faizan Ullah (Bacha Khan University Charsadda, Oman)

Session A1-6 Handling Imbalanced Data in Convolutional Neural Network on Apache Spark
Thet Hsu Aung (University of Information Technology, Myanmar) and Aye Myat Myat Paing (Univeristy of Information Technology, Myanmar)

Session A1-7 Voice Pathology Detection Using Decision Tree Classifier
Fahad Taha AL-Dhief, Nurul Mu'azzah Abdul Latiff and Nik Noordini Nik Abd Malik (Universiti Teknologi Malaysia, Malaysia); Marina Mat Baki (Universiti Kebangsaan Malaysia, Malaysia); Naseer Sabri (University Malaysia Perlis, Malaysia); Musatafa Abbas Abbood Albadr (Basrah University for Oil and Gas, Iraq); Nurul Fariesya Suhaila Md Sazihan (Universiti Teknologi Malaysia, Malaysia)

[Session B1] Machine Learning 2

Oct. 11, 08:30~10:30

Chair : Dr. Haesik Kim (VTT Technical Research Centre, Finland)

Session B1-1 Deep Learning-Based Event Prediction for Text Analysis
Muhammad Waseem (Beijing Institute of Technology, China); Qasim Umer and Choonhwa Lee (Hanyang University, Korea (South)); Sungwook Chung (Changwon University, Korea (South)); Zohaib Latif (Nazarbayev University, Kazakhstan)

Session B1-2 Asma'ak: An Emarati Sign Language Translator
Maha Ahmed, Shaikha Jasem, Khawla Saleh, Asad Khattak and Omar Alfandi (Zayed University, United Arab Emirates)

Session B1-3 GLEAM: GAN and LLM for Evasive Adversarial Malware
Dharani Devadiga (Green Level High School, USA); Gordon Jin (Seven Lakes High School, USA); Bisti Potdar (Vernon Hills High School, USA); Hankyu Koo (Bellarmine College Preparatory High School, USA); Andrew Han (Westlake High School, USA); Anusha Shringi (Lynbrook High School, USA); Angad Singh (Robbinsville High School, USA); Kinjal Chaudhari (University of Illinois Urbana-Champaign, USA); Saurav Kumar (University of Illinois at Urbana-Champaign & Stanford University, USA)

Technical Paper Sessions

Session B1-4 Vitexco: Exemplar-based Video Colorization using Vision Transformer
Duong Thanh Tran, Nguyen Doan Hieu Nguyen, Trung Thanh Pham, Phuong-Nam Tran and Thuy-Duong Thi Vu (FPT University, Vietnam); Duc Ngoc Minh Dang (FPT University, Ho Chi Minh, Vietnam)

Session B1-5 Convolutional Neural Network Based Identification of Respiratory Disease (CNN-IRD)
Qasim Umer (Hanyang University, Korea (South)); Zunaira Naveed (Institute of Southern Punjab, Pakistan); Choonhwa Lee (Hanyang University, Korea (South)); Asif Ali (Beijing Institute of Technology, China); Malik Khizar Saeed (COMSATS University Islamabad, Pakistan)

Session B1-6 Deep Learning-based Dimensionality Reduction for Anomaly Detection in Smart Grids
Anila Kousar and Saeed Ahmed (Mirpur University of Science and Technology, Pakistan); Abdullah Altamimi (Majmaah University, Saudi Arabia); Su Min Kim (Tech University of Korea, Korea (South)); Zafar Ali Khan (Mirpur University of Science and Technology, Pakistan)

Session B1-7 Enhanced Labeling Technique for Reddit Text and Fine-Tuned Longformer Models for Classifying Depression Severity in English and Luganda
Richard Kimera (Handong Global University & Mbarara University of Science and Technology, Korea (South)); Daniela N Rim (Handong Global University, Korea (South)); Joseph Kirabira (Busitema University, Uganda); Ubong Godwin Udomah (University of Uyo Teaching Hospital, Nigeria); Heeyoul Choi (Handong Global University, Korea (South))

[Session C1] Algorithms

Oct. 11, 08:30~10:30

Chair : Prof. Asad Masood Khattak (Zayed University, UAE)

Session C1-1 Partial Granger causality-based feature selection algorithm for workload prediction in cloud systems
Changhoon Lee (AI Lab & Okestro, Korea (South)); Eunsoo Ko, MinJae Song and Hoyeong Yun (OKESTRO, Korea (South)); WooJu Kim (Yonsei University, Korea (South))

Session C1-2 An Automated 3D Model Generation Framework for Construction Equipment Images using Edge Detection Algorithm
Jae-Kun Lee (Yonsei University, Korea (South)); Hye-Min Lee (UST KICT School, Korea (South)); Hyoun-Seok (KICT, Korea (South))

Session C1-3 StyleBoost: A Study of Personalizing Text-to-Image Generation in Any Style using DreamBooth
Junseo Park, Beomseok Ko and Hyeryung Jang (Dongguk University, Korea (South))

Session C1-4 Dual Attention Cascade Transformer for Polyp Segmentation
Yuan Ju, Bingxin Wei and Haewoon Nam (Hanyang University, Korea (South))

Session C1-5 Latent-Variable Classifiers Based on Total Correlation for Dynamic Environments
Cheol Ho Kim (Electronics and Telecommunications Research Institute, Korea (South)); Jung-Hoon Lee (ETRI, Korea (South)); Byounghwa Lee (Eletronics and Telecommunications Research Institute, Korea (South)); Ock Kee Baek (ETRI(Electronics and Telecommunications Research Institute), Korea (South))

Session C1-6 QC-LDPC codes from various Golomb Rulers
Daekyeong Kim, Hyojeong Choi and Hong-Yeop Song (Yonsei University, Korea (South))

Technical Paper Sessions

[Session D1] ICTC Workshop on 3D Communication Networks (IW3CN)

Oct. 11, 08:30~10:30

Chair : Prof. Jihwan Choi (Korea Advanced Institute of Science and Technology, Korea)

Session D1-1 Maneuver by Airstreams for Stratospheric Balloon Base Stations
Hyeonsu Lyu and Hyun Jong Yang (POSTECH, Korea (South))

Session D1-2 Hybrid Beamforming-based Beam Tracking using Angular speed in Massive MIMO Systems
Seungseok Sin, Yuna Sim and Jihun Cho (Chonnam National University, Korea (South)); Kyunam Kim (Alps Electric Korea Company Limited, Korea (South)); Huaping Liu (Oregon State University, USA); Jihyung Kim (ETRI, Korea (South)); Sangmi Moon (Korea Nazarene University, Korea (South)); Intae Hwang (Chonnam National University, Korea (South))

Session D1-3 Age of Information Analysis for Cache-enabled UAV Networks
Yong Lee (Sungkyunkwan University, Korea (South)); Mingun Kim (Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea (South)); Jemin Lee (Sungkyunkwan University (SKKU), Korea (South))

Session D1-4 Multi-User Beamforming under Per-Antenna Power Constraint
Sucheol Kim (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Hyeongtaek Lee (Korea Advanced Institute of Science and Technology (KAIST), Korea (South)); Hwanjin Kim and Junil Choi (KAIST, Korea (South))

Session D1-5 Downlink Satellite Network Analysis with Beam Gain in Shadowing Channel
Sungyu Kim (Chungnam National University, Korea (South)); Seunghyeong Yoo (Ulsan National Institute of Science and Technology, Korea (South)); Jinseok Choi (Korea Advanced Institute of Science and Technology, Korea (South))

Session D1-6 DRL-Based Satellite Network Slice Planning and Handover in the Korean Peninsula Scenarios
Seonghoon Kim (Korea Advanced Institute of Science and Technology, Korea (South)); Taeyeoun Kim and Jeongho Kwak (DGIST, Korea (South)); Jihwan P. Choi (Korea Advanced Institute of Science and Technology, Korea (South))

Session D1-7 Modeling of Computation Offloading for LEO Satellite-Assisted Federated Learning on Ground-Space Integrated Architecture
Jeonghwan Kim and Jeongho Kwak (DGIST, Korea (South))

[Session E1] ICTC Workshop on Artificial Intelligence in Healthcare (IWAIH)

Oct. 11, 08:30~10:30

Chair : Prof. Sunghyun Cho (Hanyang University, Korea)

Session E1-1 Meta-learning Based Obstructive Sleep Apnea Detection Using Single-Lead ECG Signals
Yinxian He, Yu Zhou and Kyungtae Kang (Hanyang University, Korea (South))

Session E1-2 Generative AI for Radiological Image Data: Current Trends and Outlook
Ji-Won Han and Yeon-Joon Lee (Hanyang University, Korea (South))

Session E1-3 Efficient Relative Coordinate Inference for Dynamic SLAM Exploiting Monocular Cameras
Seung-Chan Yu, Ji-Sung Park and Dong-Ho Lee (Hanyang University, Korea (South))

Session E1-4 Who Can be Your AI Doctor?: Evaluation for Disease diagnosis on Large Language Models
Jonghyeon Kim, Chan-Yang Ju and Dong-Ho Lee (Hanyang University, Korea (South))

Session E1-5 Uncertainty-based Active Learning with Ensemble Technique for Enhancing the Performance of Natural Language Classification with Limited Data
Seong-Won Jeon and Dong-Ho Lee (Hanyang University, Korea (South))

Technical Paper Sessions

Session E1-6 Leveraging Deep Generative Model For Causal Effect Estimation in Healthcare
Yushin Kim, Sejong Lee and Sunghyun Cho (Hanyang University, Korea (South))

[Session F1] ICTC Workshop on Quantum Deep Learning (IWQDL)

Oct. 11, 08:30~10:30

Chair : Prof. Joongheon Kim (Korea University, Korea)

Session F1-1 Quantum Federated Learning for Vehicular Computing Scenarios
Joongheon Kim (Korea University, Korea (South))

Session F1-2 Lattice surgery-based logical operations in a fault-tolerant quantum software framework
Youngchul Kim (ETRI, Korea (South)); Soo-Cheol Oh (Electronics and Telecommunications Research Institute, Korea (South)); Sangmin Lee (ETRI, Korea (South)); Ki-Sung Jin and Gyuil Cha (Electronics and Telecommunications Research Institute, Korea (South))

Session F1-3 Quantization-based Optimization with Perspective of Quantum Mechanics
Jinwuk Seok (Electronics and Telecommunication Research Institute, Korea (South)); Chang-Sik Cho (ETRI & (Electronics and Telecommunications Research Institute), Korea (South))

Session F1-4 Identifying Recent Research Topics in Post-Quantum Cryptography via Topic Modelling
Boyeon Song and Tae Jong Kim (Korea Institute of Science and Technology Information, Korea (South))

Session F1-5 A Grover-like Quantum Algorithm for Minimum Distance Decoding of Linear Block Codes
Gangsan Kim (Yonsei University & Korea Army Training and Doctrine Command, Korea (South)); Jong-shick Oh (Korea Army Training Doctrine Command, Korea (South))

Session F1-6 Introduction to Quantum Centralized-Critic and Multiple-Actor Networks
Joongheon Kim (Korea University, Korea (South))

Session F1-7 Introduction to Quantum Neural Networks
Joongheon Kim (Korea University, Korea (South))

[Session P1] Poster Session 1

Oct. 11, 08:30~10:30

Chair : Prof. Jun Koo Lee (Sungkyunkwan University, Korea)

Session P1-1 Low-Cost Small B5G Antenna of a Metamaterial Toughening the LoS Signal in Indoor Propagation
Sungtek Kahng, JWoogon Kim, Yejune Seo and Jaewon Koh (Incheon National Univeristy, Korea (South)); Inyeol Moon (NISSHA & Korea, Korea (South)); Seongbu Seo (Incheon National University, Korea (South))

Session P1-2 CSI feedback compression based on deep learning using wavelet transform
Yong Jin Kwon (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Anseok Lee and Heesoo Lee (ETRI, Korea (South))

Session P1-3 Security Technology for C-Band Modem Communication in Unmanned Vehicle Environment
Juhan Kim (Electronics and Telecommunicatons Research Institute, Korea (South)); Yousung Kang (ETRI, Korea (South))

Session P1-4 A highly reliable power saving method for IoT devices in a wireless environment
Minsuk Choi and Jaedeok Lim (ETRI, Korea (South))

Technical Paper Sessions

Session P1-5 Beam Tracking Using Monopulse Signal for UAV Communications With Doppler Shift
Dong-Hwee Kim (Korea University, Korea (South)); Byungju Lim (Pukyong National University, Korea (South)); Young-Chai Ko (Korea University, Korea (South))

Session P1-6 A Method of Access Node Change in Multi-Radio Multi-Connectivity
Sunmi Jun, Yong Seouk Choi and Heesang Chung (ETRI, Korea (South))

Session P1-7 How Technologies like AI Affect the Profit Rate: Empirical Study for 6 Capitalist Countries
Seong-Jin Park (Ajou University, Korea (South))

Session P1-8 Supervised Learning based Small Cell Planning
Seok-Young Bang and Sang-Yeon Lee (Kyunghee University, Korea (South)); Byungsuk Kim and Kyeongjun Shin (Korea Telecom (KT), Korea (South)); Een-Kee Hong (Kyunghee University, Korea (South))

Session P1-9 Interference due to Phase Noise in Downlink Multi-TRP Scenario
Kyeongpyo Kim (Electronics and Telecommunications Research Institute, Korea (South)); Wooram Shin (Electronics and Telecommunications Research Institute & Korea Advanced Institute of Science and Technology, Korea (South)); Kapseok Chang (ETRI, Korea (South)); Young-Jo Ko (Electronics and Telecommunications Research Institute, Korea (South))

Session P1-10 Sparse Channel Feedback for Energy-Efficient mmWave Massive MIMO Systems
Seungnyun Kim, Jiao Wu, Jihoon Moon and Byonghyo Shim (Seoul National University, Korea (South))

Session P1-11 A Framework for Learning Approximate Query Processing for Tabular Data with Trajectory
Kihyuk Nam, Sung-Soo Kim, Choon Seo Park, Taek Yong Nam and Taewhi Lee (ETRI, Korea (South))

Session P1-12 The Channel Estimation based on FSC Method for IEEE 802.11p OFDM System
Kyunbyoung Ko (Korea National University of Transportation, Korea (South)); Hanho Wang (Sangmyung University, Korea (South))

Session P1-13 A Dynamic HARQ Feedback Method in NR Communication Systems
Namsuk Lee and Heesang Chung (Electronics and Telecommunications Research Institute, Korea (South))

Session P1-14 Direction Finding Method for Fast Beam Alignment in Wireless Communication Systems
Seon-Ae Kim (Electrics and Telecommunications Research Institute, Korea (South)); Heesang Chung (ETRI, Korea (South)); Young-Hoon Kim (Electronics and Telecommunications Research Institute, Korea (South))

Session P1-15 Overview of 5G-NR-V2X System and Analysis Methodology of Communication Performance
Byoungman An, Seonghyun Jang, Sang Hun Yoon, Jimin Lee and Kitaeg Lim (Korea Electronics Technology Institute, Korea (South))

Session P1-16 Test of UHD/HD Integrated MATV Functions in real environment
JaeHwui Bae, Haechan Kwon, Youngsu Kim, JaeHyun Seo and Sung-Ik Park (Electronics and Telecommunications Research Institute, Korea (South))

Session P1-17 A Study on a 3D Spatial Mapping System to Investigate Skyscrapers Using Drones
Sang-Su Kim, Hee-Tac Jung, Seung-Jae Lee, Ji-Yeon Kang, Jin-Ho Park and Jun-Hui Go (ICTWAY, Korea (South))

Session P1-18 Multi Carrier Cell management and mobility enhancement
Jun-Sik Kim (ETRI, Korea (South)); Soon-Gi Park (Electronics and Telecommunications Research Institute, Korea (South)); Yong-Seouk Choi (ETRI, Korea (South))

Session P1-19 A D-band 1-channel Beamforming Transmitter Integrated Circuits for 6G mobile communication
Seunghun Wang (Electonics and Telecommunications Research Institute, Korea (South)); Hyoryeong Jeon (KAIST, Korea (South), Korea (South)); Yeonseung Kim (KAIST, Korea (South)); Seunghyun Jang (ETRI, Korea (South)); Hui-Dong Lee

Technical Paper Sessions

(Electonics and Telecommunications Research Institute, Korea (South)); Sunwoo Kong (Electronics and Telecommunications Research Institute, Korea (South)); Bonghyuk Park (ETRI, Korea (South)); Songcheol Hong (KAIST, Korea (South)); Sang-gug Lee (Korea Advanced Institute of Science and Technology (KAIST), Korea (South)); Jung-Hwan Hwang (Electronics and Telecommunications Research Institute, Korea (South))

Session P1-20 Video Streaming QoS Prediction based on Downlink Control Information of LTE Cell
GyeongJune Hahm, MinHo Han and HyeYeon Kwon (ETRI, Korea (South))

Session P1-21 A Brief Survey of Watermarks in Generative AI
JaeYoung Hwang and SangHoon Oh (Telecommunications Technology Association, Korea (South))

Session P1-22 Study on Test Plan Establishment for Enhancing Trustworthiness of Artificial Intelligence Systems
Yejin Shin and Sangyeon Kang (Telecommunications Technology Association, Korea (South))

Session P1-23 Space and Cost-Efficient Reed-Solomon Code based Distributed Storage Mechanism for IPFS
Heekyung Shin (Sungshin Women's University, Korea (South)); Myungcheol Lee (ETRI, Korea (South)); Seongmin Kim (Sungshin Women's University, Korea (South))

[Session A2] Convergence 1

Oct. 11, 13:00~14:30

Chair : Prof. Haejoon Jung (Kyung Hee University, Korea)

Session A2-1 Animal Feed Optimization under Price Fluctuations using Evolutionary Algorithms
Member Joy Usigbe (Kyungpook National University, Daegu, Korea (South)); Daniel Dooyum Uyeh (Michigan State University, USA); Daison Darlan and Rammohan Mallipeddi (Kyungpook National University, Daegu, Korea (South))

Session A2-2 Enhancing Social Interaction Skills for Autism Spectrum Disorder (ASD) Individuals in the Metaverse
Arunima Sharma (Universit¨at Hamburg, Germany); Vaishali Babu (Vishwakarma University, India)

Session A2-3 Predictive Analysis of Accidents Based on US Accident Data
Mayura Manawadu (Kyungpook National University, Korea (South)); Udaya Wijenayake (University of Sri Jayewardenepura, Sri Lanka)

Session A2-4 Analysis for binary chaotic sequences generated by cascade chaotic maps
Hyojeong Choi, Daekyeong Kim, Sangwon Chae and Hong-Yeop Song (Yonsei University, Korea (South)); Yundong Lee, Sangung Shin and Hongjun Noh (LIG Nex1, Korea (South))

Session A2-5 Some New Binary Locally Repairable Codes with Availability based on Golomb Rulers
Hyojeong Choi and Hong-Yeop Song (Yonsei University, Korea (South))

Technical Paper Sessions

[Session B2] Wireless 1

Oct. 11, 13:00~14:30

Chair : Prof. Dong Seog Han (Kyungpook Nat'l University, Korea)

Session B2-1 RIS-assisted MEC Computation Offloading for IoVT Networks
Daniar Estu Widiyanti and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

Session B2-2 Energy Collaboration Based on Borrowing and Returning Mechanism with Demand Diffusion
Min Li, Jiafu Zhao and Xuan Fu (Chongqing University of Posts and Telecommunications, China)

Session B2-3 A Robust Algorithm for Impulsive Noise Mitigation in OFDM Systems
Der-Feng Tseng (National Taiwan University of Science and Technology, Taiwan)

Session B2-4 OCDM System with PAPR Reduction for Sub-THz Wireless Communication
Md. Moklesur Rahman and Heung-Gyoon Ryu (Chungbuk National University, Korea (South))

Session B2-5 Deep Reinforcement Learning Based Opportunistic Routing for Cognitive Relay Networks
Jintaek Oh (School of Electrical and Electronic Engineering, Yonsei University, Korea (South)); Hyunjoon Suh, Shinhyeok Kang and Taewon Hwang (Yonsei University, Korea (South))

Session B2-6 DRL-Based AP Switch On/Off Scheme for Cell-Free Massive MIMO MEC Networks
Hyunjoon Suh, Jintaek Oh, Shinhyeok Kang and Taewon Hwang (Yonsei University, Korea (South))

[Session C2] Localization

Oct. 11, 13:00~14:30

Chair : Prof. Syed Imran Hussain Shah (Chung-Ang University, Korea)

Session C2-1 Statistical Approach for Robust Indoor Positioning against Signal Variations
Junhaeng Lee (University of Science and Technology & Electronics and Telecommunications Research Institute, Korea (South)); KyongHo Kim and JaeJun Yoo (ETRI, Korea (South))

Session C2-2 Deep Learning-based Localization Using Spatial Information in the NLoS Scenarios
Yongjun Ahn, Inkook Keum, Jinwoo Son and Byonghyo Shim (Seoul National University, Korea (South))

Session C2-3 Outdoor Long Range Ubiquitous Projectiles Tracking System Using P-MPLR and Computer Vision
Minjae Kim (Kyung Hee University, Korea (South)); Hansu Jeong (Sangmyung University, Korea (South)); Jeongwon Moon (Kyungpook National University, Korea (South)); Donghyeon Na (Sangmyung University, Korea (South)); Woojin Choi (Sun Moon University, Korea (South)); Sophia Lee, Ethan O Sullivan and Anthony Smith (Purdue University, USA)

Session C2-4 Laboratory Verification Process for Redirection Algorithm Design using GNSS Deception
Myoung-Ho Chae, Seung-Ho Choi, Chae-Taek Choi and Chang-Hoon Lee (Agency for Defense Development, Korea (South))

Session C2-5 Analysis of Traveling Performance for Orchard Weeding Robot based on GNSS
Jintack Jeon (Chungnam National Univeriaty, Korea (South)); Hoseung Jang, Changju Yang, Kyoung-do Kwon, Youngki Hong and Gookhwan Kim (National Institute of Agricultural Science, Korea (South))

Session C2-6 Ground Truth Generation Algorithm for Medium-Frequency R-Mode Skywave Detection
Suhui Jeong (Yonsei University, Korea (South)); Pyo-Woong Son (KRISO, Korea (South))

Technical Paper Sessions

[Session D2] ICTC Workshop on Information and Communication Strategic Technology for Industry Convergence (IWICST) 1

Oct. 11, 13:00~14:30

Chair : Prof. Yeonho Chung (Pukyong Nat'l University, Korea)

Session D2-1 Performance Evaluation for Absolute Time Synchronization in Wireless Time-Sensitive Service
Yong Sun Kim and Kapseok Chang (ETRI, Korea (South)); Young-Jo Ko (Electronics and Telecommunications Research Institute, Korea (South))

Session D2-2 A Method for Reducing Simulation Timing Deviation in QEMU-Based Virtual ECU
Anna Yang (Korea Aerospace University & Company of Drimaes, Korea (South)); Woo Hyun Seol (D RIMAES, Korea (South)); Hyeong Rae Kim (Kyungpook National University, Korea (South)); Jin Yong Kim and Woo Jin Han (D RIMAES, Korea (South)); Jeonghun Cho (Kyungpook National University, Korea (South))

Session D2-3 An I/O Simulation Method for AUTOSAR-Based Operation Verification in an QEMU-Based Virtual ECU
Anna Yang (Korea Aerospace University & Company of Drimaes, Korea (South)); Hyeong Rae Kim (Kyungpook National University, Korea (South)); Daehyun Kum (DGIST, Korea (South)); Woo Jin Han (D RIMAES, Korea (South)); Jae Gon Kim (Korea Aerospace University, Korea (South)); Jeonghun Cho (Kyungpook National University, Korea (South))

Session D2-4 Fault Dianosis Method Using Convolutional Recurrent Neural Network for Rotating Machine
Namkyun Kim (Korea Automotive Technology Institute, Korea (South)); Chanjun Chun (Chosun University, Korea (South)); Si Jun Park, Seongmin Yun and Yong Ha Sung (Korea Automotive Technology Institute, Korea (South))

Session D2-5 Research and Development of AI Convergence Hazardous Chemicals Detection System
Yeon Jin Kim (Seowon University, Korea (South)); Bo Ri Sim (Seowon University, Korea (South)); A Rong Yoon (Seowon University, Korea (South)); Sook Kyung Jo (VAIV Company, Korea (South)); Bong Seop Park (National Fire Agency, Korea (South)); Gyoung Bae Kim (Seowon University, Korea (South))

Session D2-6 A FMI-based Approach for CAN Bus Simulation and Simulink Model Integration in Vehicle Simulation Environment
Hyeongrae Kim, Harim Lee and Jeonghun Cho (Kyungpook National University, Korea (South))

[Session E2] ICTC Workshop on 6G STAR-MAC (IW6STAR)

Oct. 11, 13:00~14:30

Chair : Prof. Dongho Kim (Seoul Nat'l University of Science and Technology, Korea)

Session E2-1 Early HARQ using LLR Trend Analysis
Narayan Prasad Kusi, Jiho Kim and Dong Ho Kim (Seoul National University of Science and Technology, Korea (South))

Session E2-2 Group-based Random Access with Age of Information Minimization in 6G umMTC
Jiseung Youn, Joohan Park, Seyoung Ahn, Soohyeong Kim and Sunghyun Cho (Hanyang University, Korea (South))

Session E2-3 Simple Power Adjustment Scheme for Uplink NOMA Based Random Access
Seok-Ju Byun, Su-Jin Lee and Ye Hoon Lee (Seoul National University of Science and Technology, Korea (South))

Session E2-4 A Network Selection Scheme to Meet Heterogeneous QoS for Massive MTC in SAGIN
Joohan Park, Jiseung Youn, Seyoung Ahn, Soohyeong Kim and Sunghyun Cho (Hanyang University, Korea (South))

Session E2-5 Optimization of Reinforcement Learning-Based Backoff Indicator for 5G NR Random Access Procedure
Jiha Kim, Cheolwoo You and Hyunhee Park (Myongji University, Korea (South))

Technical Paper Sessions

[Session F2] ICTC Workshop on Satellite Information Utilization (IWSIU, Special Session for ITRC, Ajou University)

Oct. 11, 13:00~14:30

Chair : Prof. Jae-Hyun Kim (Ajou University, Korea)

Session F2-1 Entropy-weighted Voting Method for Diffusion-based Semantic Segmentation
Seonggyun Jeong and Yong Seok Heo (Ajou University, Korea (South))

Session F2-2 Ship Detection in Synthetic Aperture Radar Images with Improved YOLOv8
Chushi Yu and Yoan Shin (Soongsil University, Korea (South))

Session F2-3 Skip Connection Model for SAR Ship Semantic Segmentation
Jin Won Jung and Yoan Shin (Soongsil University, Korea (South))

Session F2-4 A Precise Positioning Method with Integration of GNSS and Doppler Shift Based Positioning using LEO Satellite
M. Humayun Kabir and Md. Ali Hasan (Ajou University, Korea (South)); Wonjae Shin (Korea University, Korea (South))

Session F2-5 Dynamic Optimization Framework for Multi-Hop Code Offloading in LEO Satellite Edge Computing
Jeonghwan Kim, Taewoo Lee and Jeongho Kwak (DGIST, Korea (South))

Session F2-6 Evaluation for Elevation Angle-Dependent Beam Size in NR over NTN Systems
Sangmin Han (Ajou University, Korea (South)); Wonjae Shin (Korea University, Korea (South)); Jae-Hyun Kim (Ajou University, South Korea, Korea (South))

[Session P2] Poster Session 2

Oct. 11, 13:00~14:30

Chair : Prof. Su Min Kim (Tech University of Korea, Korea)

Session P2-1 Intelligent electronic monitoring supervision system based on multi-label classification
Suwan Park and Geonwoo Kim (Electronics and Telecommuncations Research Institute, Korea (South))

Session P2-2 A Method for Optimizing Water Quality of the Aquafarm Using Application Independent Digital Twins
Hyeon Park, Dae-Heon Park and Seng-Kyoun Jo (ETRI, Korea (South))

Session P2-3 Occupational Health Service Platform Architecture based on IoT and Edge Computing
Kyoungjae Sun and Sung Hei Kim (ETRI, Korea (South)); Hyungho Do (HealthAll, Korea (South))

Session P2-4 Advanced Metering Infrastructure Data Platform in Housing: Standardization Strategy
Eunbi Ko and Guk Sik Jeong (Telecommunications Technology Association, Korea (South))

Session P2-5 Platform Design for IoT Data Quality Improvement through Flexible Preprocessing Pipeline Building
Jaewon Moon, Seungwoo Kum and Seungtaek Oh (Korea Electronics Technology Institute, Korea (South))

Session P2-6 ChatGPT Powered Digital Healthcare System
Jaeyong Lee, Gyeyoung Jung, Young Chang, Yuju Kang and Jaejeung Kim (Chungnam National University, Korea (South))

Technical Paper Sessions

Session P2-7 Energy efficient operation method of iterative channel decoder in wireless communication systems
Yong Su Lee (Electronics and Telecommunications Research Institute, Korea (South)); Jun Woo Kim and Moon Young Jin (ETRI, Korea (South)); Bahng Seungjae (Electronics and Telecommun. Research Institute, Korea (South)); Jang-won Moon, Bang Youngjo, Hoon Lee, JungSook Bae and Heesoo Lee (ETRI, Korea (South))

Session P2-8 Dog Bowel Pad Training IoT by Automatic Snack Feeder and Owner's Voice Compliment Speaker for Human Convenience
Subin Kim, Eunsoo Kim, Choeun Lee, Yujin Jeong and Ahyeon Song (Chungnam National University, Korea (South)); Jaden Soroka and Anthony Smith (Purdue University, USA)

Session P2-9 Running Gait Posture Optimization Using Embedded IoT Sensor Shoes
Hojeong Eom, Suyoung Lee, Jihyeon Yun and Hyejin Kim (Chungnam National University, Korea (South)); Minju Kim (Soongsil University, Korea (South)); Nicole Hornbrook and Eric Matson (Purdue University, USA)

Session P2-10 Impact of Channelization on Two Power Allocation Schemes at 6 GHz Band
Igor Kim and Bongsu Kim (ETRI, Korea (South)); Seungkeun Park (Electronics and Telecommunications Research Institute, Korea (South))

Session P2-11 Power-Supporting Operation of Energy Storage for Energy-Independent Housing Complex
Sewan Heo, Tai-yeon Ku and Wan-Ki Park (ETRI, Korea (South))

Session P2-12 Client-centric on-demand remote profile provisioning technique for M2M IoT Devices
Boheung Chung, Taesung Kim, Keonwoo Kim and Yousung Kang (ETRI, Korea (South))

Session P2-13 Optimal evacuation path search scheme for fire situations using 5G communication technology
Mahnsuk Yoon, Jaeuk Kwon and Hyunjoo Lee (Gumi Electronics & Information Technology Research Institute, Korea (South)); Gilhwan Lim and Hyunchul Choi (Daon Co., Ltd., Korea (South); Kyucheol Cho (Kyungpook National University, Korea (South))

Session P2-14 Fire evacuation situation recognition and evacuation route search scheme of 5G-based mobile system
Mahnsuk Yoon, Jaemin Lee and Hyunjoo Lee (Gumi Electronics & Information Technology Research Institute, Korea (South)); Gilhwan Lim and Hyunchul Choi (Daon Co., Ltd., Korea (South); Kyucheol Cho (Kyungpook National University, Korea (South))

Session P2-15 Enhancing MPTCP Performance on High-Speed Trains with Predictive Handover-Aware Packet Scheduling
Min-Ki Kim and You-Ze Cho (Kyungpook National University, Korea (South))

Session P2-16 A method for synchronizing situation information and providing customized task using the disaster situation management decision support platform
Eunjoo Kim, Sun-Hwa Lim, Sang Gi Hong and Kang Bok Lee (Electronics and Telecommunications Research Institute, Korea (South))

Session P2-17 Short-term Korea East-sea Temperature Forecasting Approach based on Seq2Seq Model using Multi Parameters
Daeseung Park, A-Ryoung Kim, Chae-Seok Lee and Ho-jong Chang (KAIST Convergence Research Center for College of Engineering, Korea (South))

Technical Paper Sessions

Session P2-18 A Comparative Analysis of Time Series Forecasting Methods for Short-Term Electricity Demand Prediction
A-Ryoung Kim (KAIST Institute for Information Technology Convergence, Korea (South)); Daeseung Park (KAIST Convergence Research Center for College of Engineering, Korea (South)); Chae-Seok Lee (KAIST Institute for IT Convergence, Korea (South)); Hojong Chang (Korea Advanced Institute of Science and Technology, Korea (South))

Session P2-19 A Study on Performance Analysis of Question Generation based on Korean Pretrained Language Model
HongYeon Yu, Jiwon Yang, Seunghun Oh, Donghoon Son, Aram Lee and Jeongeun Kim (Electronics and Telecommunications Research Institute, Korea (South))

Session P2-20 Performance Analysis of Multiple High Altitude Platform Stations Cellular Network Coverage
Jaeyeol Lee (Ajou Unviersity, Korea (South)); Tae-Yoon Kim (Ajou University, Korea (South)); Jae-Hyun Kim (Ajou University, South Korea, Korea (South))

Session P2-21 Performance Analysis of V2X with Enhanced Power Control
Manho Park and Heesang Chung (ETRI, Korea (South))

Session P2-22 Comparison of goTenna and ClusterDuck Protocol: Evaluation of the Performance under Various Conditions
Jinmyeong Lee, Geonu Lim, Sihyeong Lee and Seonghyeon Bae (Chungnam National University, Korea (South)); Ryan A Melenchuk and Anthony Smith (Purdue University, USA)

Session P2-23 Decentralized Identifiers and NFT-Driven Blockchain Solution for Personal Data Trading
DaeGeun Yoon, KiSung Park, SungJin Moon and SungKee Noh (ETRI, Korea (South))

Session P2-24 BSS: An Efficient Block Storage System for Block Archive Service in Blockchains
Woochang Jeong (POSTECH, Korea (South)); Chanik Park (Pohang University of Science and Technology, Korea (South))

Session P2-25 Policy negotiation in 6G Dynamic Frequency Sharing System
Minji Phi (Yonsei University, Korea (South)); Kwang Soon Kim (Yonsei University, Korea (South))

Session P2-26 Multichannel Random Access Optimization Via Evolutionary Algorithm
Zhaokun Shao (Hanyang University, Korea (South)); Muhammad Sohaib (Hanyang University, Korea (South)); Jianyu Li (Hanyang University, Korea (South)); Sang-Woon Jeon (Hanyang University, Korea (South))

Session P2-27 Resource Allocation Under Strict AoI Constraints
Muhammad Sohaib (Hanyang University, Korea (South)); Hu Jin (Hanyang University, Korea (South)); Sang-Woon Jeon (Hanyang University, Korea (South))

Session P2-28 Analysis Method for Semantic Communication Based Automated Control Systems
Kwanghoon Lee (Yonsei University, Korea (South)); Jonghyun Kim (Yonsei University, Korea (South)); Eui Whan Jin (Yonsei University, Korea (South)); Min Ji Phi (Yonsei University, Korea (South)); Veronika Christine Bayer (Yonsei University, Korea (South)); Kwang Soon Kim (Yonsei University, Korea (South))

Session P2-29 Channel Generation Model in Upper Mid-Band and Analysis of Statistical Characteristics
Eui Whan Jin (Yonsei University, Korea (South)); Jonghyun Kim (Yonsei University, Korea (South)); Kwanghoon Lee (Yonsei University, Korea (South)); Minji Phi (Yonsei University, Korea (South)); Veronika Bayer (Yonsei University, Korea (South)); Kwang Soon Kim (Yonsei University, Korea (South))

Session P2-30 Risk Analysis of Adversarial Attacks on Biometric Systems
Seong Hee Park (Hongik University, Korea (South)); Youn Kyu Lee (Hongik University, Korea (South))

Technical Paper Sessions

Session P2-31 Service Availability of HAPS considering its elevation angle, density, and altitude
Hyunduk Kang (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Ho-kyung Son (ETRI, Korea (South))

Session P2-32 MMSE-based Turbo Equalization Schemes with Damping for Coded OTFS Systems
Wooram Shin (Electronics and Telecommunications Research Institute & Korea Advanced Institute of Science and Technology, Korea (South)); Kyeongpyo Kim (Electronics and Telecommunications Research Institute, Korea (South)); Kapseok Chang (ETRI, Korea (South)); Young-Jo Ko (Electronics and Telecommunications Research Institute, Korea (South))

Session P2-33 A Study on Switching between Aerial Systems with UxNB Functionality
JungSook Bae, Hyun Lee and Heesoo Lee (ETRI, Korea (South))

Session P2-34 A Study on Intelligent Manufacturing Video and Control Data Transmission System Using 5G Communication
Sung-hun Lee, Yong-An Jung, Dong-Cheul Han, Soo-Hyun Cho and Sang-Bong Byun (Gumi Electronics & Information Technology Research Institute, Korea (South))

[Session A3] Networks 1

Oct. 11, 14:50~16:20

Chair : Prof. Suk Chan Kim (Pusan Nat'l University, Korea)

Session A3-1 A System for Constructing Spanning Trees in Graph Networks that Utilize Integer Linear Programming to Enhance Link Fault Tolerances
Hieu Tran The, Kosuke Fujita and Nattapong Kitsuwan (The University of Electro-Communications, Japan)

Session A3-2 Spectrum Slicer Placement Optimization by Betweenness Centrality in Elastic Optical Network
Tsubasa Hachiya and Nattapong Kitsuwan (The University of Electro-Communications, Japan)

Session A3-3 Cache Node Placement for Maximum Traffic Minimization in Content-Centric Networking
Shohei Nakajima and Nattapong Kitsuwan (The University of Electro-Communications, Japan)

Session A3-4 Dynamics of random sparse matrix network topology
Takako Hoshiyama (The University of Tokyo & Research Center, Japan); Hironori Shimoyama (Professional of Computational Science and Education, Japan)

Session A3-5 Data-Driven Geometric Programming for System-Level Performance Optimization
Soihem Gonmei (Seoul National University of Science and Technology, Korea (South)); JunHwan Lee (ETRI, Korea (South)); Taesoo Kwon (Seoul National University of Science and Technology, Korea (South))

Session A3-6 A Study on the Scalability and Feasibility of the Space-air Integrated Network
Seungwoo Baek and Saewoong Bahk (Seoul National University, Korea (South))

Technical Paper Sessions

[Session B3] IoT 1

Oct. 11, 14:50~16:20

Chair : Prof. Gabriel Avelino Sampedro (UP Open University, Philippines)

Session B3-1 On the Scalability of Parking Trajectory Optimization of Autonomous Ground Vehicles
Esther Aboyeji, Oladayo Ajani and Rammohan Mallipeddi (Kyungpook National University, Korea (South));

Session B3-2 Offloading Utility Optimization in Parked Vehicular Edge Computing
Xuan-Qui Pham and Dong-Seong Kim (Kumoh National Institute of Technology, Korea (South))

Session B3-3 Efficient IoT Devices Deployment Using Branch and Bound Method
Haesik Kim (VTT Technical Research Centre of Finland, Finland)

Session B3-4 A Novel of RTK Survey with TGM2017 Height Determination using IoT Device
Thawanrat Khumsa and Nikorn Sutthisangiam (King Mongkut's University of Technology North Bangkok, Thailand)

Session B3-5 Anomalous Human Trajectory Detection Using Clustering Methods
Doi Thi Lan and Seokhoon Yoon (University of Ulsan, Korea (South))

Session B3-6 Towards Temporal Dependency Identification based on Multivariate Time Series IIoT Data
Abubakar Isah, Hyeju Shin, Sani Ahmad Hassan, Seugmin Oh and Jinsul Kim(Chonnam National University, Korea (South))

[Session C3] Mobility 2

Oct. 11, 14:50~16:20

Chair : Prof. Junsu Kim (Tech University of Korea, Korea)

Session C3-1 Detection method of Blind Spots Region on Merging Section Using V2X Communication of Autonomous Vehicles
Hyeong-Seok Yun (Korea Intelligent Automotive Parts Promotion Institute, Korea (South)); Tae-Hyeong Kim (Korea Automotive Parts Promotion Institute, Korea (South)); Jae-Ho Seong (Korea Intelligent Automotive Parts Promotion Institute, Korea (South)); Yun-Ki Yoon and Kyung-Su Yun (KIAPI, Korea (South)); Tae-Hyoung Park (Chungbuk National University, Korea (South))

Session C3-2 Optimization of collision-free trajectories for advanced air mobility under risk of a non-cooperative intruder
Uihwan Choi (Electronics and Telecommunications Research Institute, Korea (South)); Soojeon Lee (ETRI & KAIST, Korea (South))

Session C3-3 Power Efficient Long Range Drone Networking System for UAV Detection
Gihwan Kim (Chungnam National University, Korea (South)); Soonchan Kwon (Chonnam National University, Korea (South)); Nahyeong Kim (Chungnam National University, Korea (South)); Nawon Kim (Chonnam National University, Korea (South)); Karteikay Dhuper, Prakshi Chander, Eric Matson and Tony Smith (Purdue University, USA)

Session C3-4 ADS: Study on the Anti-Drone System: Today's Capability and Limitation
Younwoo Ki, Suhyun Chun and Jihoon Ryoo (SUNY Korea, Korea (South))

Session C3-5 Detection of Pedestrian Turning Motions to Enhance Indoor Map Matching Performance
Seunghyeon Park, Taewon Kang and Seungjae Lee (Yonsei University, Korea (South)); Joon Hyo Rhee (Korea Research Institute of Standards and Science, Korea (South))

Technical Paper Sessions

[Session D3] ICTC Workshop on Information and Communication Strategic Technology for Industry Convergence (IWICST) 2

Oct. 11, 14:50~16:20

Chair : Dr. Wooyong Lee (Electronics and Telecommunications Research Institute, Korea)

Session D3-1 An Efficient Cubic Spline Interpolation Scheme for Wireless Communication Systems
Byung-Jae Kwak, Jin Kyeong Kim, Keunyoung Kim and Young-Jo Ko (Electronics and Telecommunications Research Institute, Korea (South))

Session D3-2 Study on Automatic Charging Devices for Electric Vehicles in Vehicle to Grid
Gyujin Seong (Dong-A University, Korea (South)); Taemok Lee (Dong-A University, Korea (South)); Dongwan Kim (Dong-A University, Korea (South))

Session D3-3 Enabling Long Range Communications and Its Demonstration
Keunyoung Kim (Electronics and Telecommunications Research Institute, Korea (South)); Woo Yong Lee (Electronics and Telecommunications Research Institute, Korea (South)); Minki Gee (Wiznova, Inc., Korea (South)); Namho Kim (Wiznova, Inc., Korea (South)); Wonseog Ko (Wiznova, Inc., Korea (South)); Younggyun Kim (Wiznova, Inc., Korea (South))

Session D3-4 Security Analysis for Applying the Proof-of-Stake Consensus Algorithm to IoET Network in Antarctica
Woo Yong Lee and Keunyoung Kim (ETRI, Korea (South))

[Session E3] ICTC workshop on intelligent 6G (IWin6G)

Oct. 11, 14:50~16:20

Chair : Prof. Wonjae Shin (Korea University, Korea)

Session E3-1 Cooperative Learning Strategy for Human Behavior Prediction Using Multi-Modal Data
Doyun Lee (Pukyong National University, Korea (South)); Hoon Lee (UNIST, Korea (South))

Session E3-2 Cluster Hopping in Multi-beam Satellite Communication Systems Using Deep Reinforcement Learning
Shruti Sharma (Ajou University, Suwon, S. Korea, Korea (South)); Sangmin Han and Jaehyup Seong (Ajou University, Korea (South)); Wonjae Shin (Korea University, Korea (South))

Session E3-3 Extraction of Motor Imagery for Operation of UAV Communication Systems
Won-Young Kang, Yoon Ku Lee, Youngjin Song, Juseung Lee and Sang Hyun Lee (Korea University, Korea (South))

Session E3-4 Trends in Deep Reinforcement Learning for Distributed Coordination and Cooperation with Homogeneous Multi-Agents
Joongheon Kim (Korea University, Korea (South))

Session E3-5 Sparse-SignSGD Optimizer for Communication-Efficient Distributed Learning
Chanho Park (Pohang University of Science and Technology, Korea (South)); Namyoon Lee (Korea University, Korea (South))

Technical Paper Sessions

[Session F3] ICTC Workshop on Post MIMO (IWPMIMO)

Oct. 11, 14:50~16:20

Chair : Prof. Chan- Byoung Chae (Yonsei University, Korea)

Session F3-1 A Study on mmWave Coverage Enhancement using Simultaneous Transmitting and Reflecting RIS
Dongsoo Jun (Yonsei University, Korea (South)); Chan-Byoung Chae (Yonsei University, Korea (South))

Session F3-2 Near-field Integrated Sensing and Communications with Beamfocusing
Siyun Yang (Yonsei University, Korea (South)); Sang-Hyun Park (Yonsei University, Korea (South)); Chan-Byoung Chae (Yonsei University, Korea (South))

Session F3-3 Electrowetting Beam Steering Device: Towards Energy Efficient Mm-Wave Wireless Network
Jeyaraj Vinoth Kumar (Yonsei University, Korea (South)); Wooho Ham (Yonsei University, Korea (South)); Jang-Yeon Kwon (Yonsei University, Korea (South))

Session F3-4 Cell-Free Massive MIMO Uplink Systems with Joint Maximum-Likelihood Detector for 6G Networks
Jeong Seon Yeom (Chungnam National University, Korea (South)); Bang Chul Jung (Chungnam National University, Korea (South))

Session F3-5 Digital-Domain Signal Compensation for Hardware Non-Idealities in Sub-THz Commmunications
Jonghyun Kim (Yonsei University, Korea (South)); Kwanghoon Lee (Yonsei University, Korea (South)); Eui Whan Jin (Yonsei University, Korea (South)); Kwang Soon Kim (Yonsei University, Korea (South))

Session F3-6 Theoretical Impact of Continuous MIMO Antenna Arrays on Degrees of Freedom
Veronika Bayer (Yonsei University, Korea (South)); Kwanghoon Lee (Yonsei University, Korea (South)); Kwang Soon Kim (Yonsei University, Korea (South))

Session F3-7 Stochastic Geometry Analysis of Position aided Beam Management
Jihoon Lee (Yonsei University, Korea (South)); Seung-Woo Ko (Inha University, Korea (South)); Seong-Lyun Kim (Yonsei University, Korea (South))

[Session P3] Poster Session 3

Oct. 11, 14:50~16:20

Chair : Prof. Youn Kyu Lee (Hongik University, Korea)

Session P3-1 Adversarial2Adversarial: Defending against Adversarial Fingerprint Attacks without Clean Images
Pyo Min Hong, So Hyun Kang, Jinhyeon Kim, Ji Hoo Kim and Youn Kyu Lee (Hongik University, Korea (South))

Session P3-2 Two-Stage Image Restoration: A Shield against Adversarial Attacks on Face Identification
Min Young Lim, Pyo Min Hong and Youn Kyu Lee (Hongik University, Korea (South))

Session P3-3 A Method on Neural Network Optimization Deployment Frameworks for Lightweight Target Devices
Jaebok Park and Kyunghee Lee (ETRI, Korea (South)); Jiyoung Kwak (Electronics and Telecommunications Research Institute, Korea (South)); Changsik Cho (ETRI & (Electronics and Telecommunications Research Institute), Korea (South))

Technical Paper Sessions

Session P3-4 CNC Milling Machine Anomaly Classification with Continual Active Learning
Eden Kim, Seungchul Son and Seokkap Ko (ETRI, Korea (South))

Session P3-5 An Neural Collaborative Filtering (NCF) based Recommender System for Personalized Rehabilitation Exercises
Yoon-Seop Chang (Electronics and Telecommunications Research Institute, Korea (South)); Boosun Jeon (ETRI, Korea (South)); NohSamPark (Electronics and Telecommunications Research Institute, Korea (South)); Mikyong Han and Jae-Chul Kim (ETRI, Korea (South))

Session P3-6 A Study on the Material Properties and Process Conditions Reasoning using Regression and Classification of Machine Learning
Hyungjong Kim (ETRI, Korea (South)); Hyunwoo Oh (Electronics & Telecommunications Research Institute, Korea (South)); Suyoung Chi (Electronics and Telecommunications Research Institute, Korea (South))

Session P3-7 Knowledge Generation Pipeline using LLM for Building 3D Object Knowledge Base
SooHyung Lee (Electronics and Telecommunications Research Institute, Korea (South)); HyeRin Lee (Sookmyung Women's University, Korea (South)); KiSuk Lee (Electronics and Telecommunications Research Institute, Korea (South))

Session P3-8 Human Detection in Infrared Image Using Daytime Model-Based Transfer Learning for Military Surveillance System
Eun Seop Kim and Whui Kim (Electronics and Telecommunications Research Institute, Korea (South)); Juderk Park (Electronics and Telecommunication Research Institute (ETRI), Korea (South)); Kunmin Yeo (Electronics and Telecommunications Research Institute, Korea (South))

Session P3-9 Handling anomaly in residential energy consumption data
Youhee Choi, Tai Yeon Ku and Wan-Ki Park (ETRI, Korea (South));

Session P3-10 Music Genre Classification with CNN Model Evaluation
Yoonhee Jang (Saint Johnsbury Academy Jeju, Korea (South))

Session P3-11 Neural Network Model Transformation Framework for On-Devices
Kyung Hee Lee, Jaebok Park, Seon-tae Kim, Ji Young Kwak, Hong Soog Kim and Chang Sik Cho (ETRI, Korea (South))

Session P3-12 Enhancing Fine-Tuning in Low Data Regime by Increasing Representation Entropy During Pre-Training Phase
Jaeill Kim, Jungwook Shin and Wonjong Rhee (Seoul National University, Korea (South))

Session P3-13 Towards Better Time-series Data Augmentation for Contrastive Learning
Jang-Ho Choi (Electronics and Telecommunications Research Institute, Korea (South)); Moonyoung Chung, Taewhi Lee and Jiyong Kim (ETRI, Korea (South))

Session P3-14 Exploring Uncertainty-aware Class-wise Thresholds for Recognition Model's Uncertainty Detection
Jihyun Hwang (University of Science and Technology & Electronics and Telecommunications Research Institute School, Korea (South)); Minsu Jang (Electronics and Telecommunications Research Institute, Korea (South))

Session P3-15 Recursive inference for individual's identification in video data based on the description
Dearo Kim, Jiyoun Lim, Jeongwoo Son and Namkyung Lee (ETRI, Korea (South))

Session P3-16 Use of Attention Mechanism for Decoder in Deep Learning-based Image Super Resolution
Hyeongyu Kim (SungKyunKwan University, Korea (South)); Byungchan Choi (LIG Nex1, Korea (South)); Haewoon Nam (Hanyang University, Korea (South))

Technical Paper Sessions

Session P3-17 Deep Learning on MCUs: Comparative Analysis of Compile and Interpreter based Execution Methods
Gunju Park, Seungtae Hong and Jeong-Si Kim (Electronics and Telecommunications Research Institute, Korea (South))

Session P3-18 Enhancing the Predictive Power with Time-Adjusted Residual Effect Simulations: Recency-Frequency and Time Regularity Measurements
Doyeon Kwak, Se-Un Park, Sunbum Youn and Emma Bergqvist (CJ AI Center, Korea (South))

Session P3-19 Implementation of deep learning based intelligent image analysis on an edge AI platform using heterogeneous AI accelerators
Ryangsoo Kim, Jaein Kim, Hark Yoo and Sung Chang Kim (ETRI, Korea (South))

Session P3-20 Unidirectional-Edge Detection based Background Subtraction method for Real-time Object Detection in Restricted Environments
Whui Kim (Electronics and Telecommunications Research Institute, Korea (South)); Ju Derk Park (Electronics and Telecommunication Research Institute (ETRI), Korea (South)); Jae Hong Ryu (ETRI, Korea (South)); Byeong Cheol Choi (Electronics and Telecommunications Research Institute, Korea (South)); Chang Won Lee (ETRI, Korea (South))

Session P3-21 AI Knows Which Words Will Appear in Next Year's Korean CSAT
Byunghyun Ban, Jejong Lee and Hyeonmok Hwang (AIEng, Korea (South))

Session P3-22 Automated labeling method for direction detection of objects inside X-ray image
Jungi Lee, HyunYong Lee and Nac-Woo Kim (ETRI, Korea (South)); Yumin Hwang (Electronics and Telecommunications Research Institute, Korea (South)); Seok-Kap Ko (ETRI, Korea (South))

Session P3-23 Golf Ball Dynamic Motion Parameter Estimation based on Ball trajectory video and LSTM
EunJi Kwak and Jungbeom Ko (Gachon University, Korea (South)); Hyunchul Kim (University of California Santa Cruz, USA); Asif Mehmood and Jungsuk Kim (Gachon University, Korea (South))

Session P3-24 Stable Robotic Grasping of Target Object Using Deep Reinforcement Learning
In Jun Park (Electronics and Telecommunications Research Institute, Korea (South)); Hyonyoung Han (ETRI, Korea (South))

Session P3-25 Power Saving Mechanisms for NR Sidelink Communication
Jicheng Yin and Seung-Hoon Hwang (Dongguk University, Korea (South))

Session P3-26 Design and Implementation of Ultra-realistic Application Service Testbed Supporting End-to-End Ultra-high Precision Networking Architecture
ByeongOk Kwak, HoSun Yoon, Seong Moon, PyungKoo Park and SeungWoo Hong (ETRI, Korea (South))

Technical Paper Sessions

October 12th (Thursday), 2023

[Session A4] Machine Learning 3

Oct. 12, 08:30~10:00

Chair : Prof. Won- Yong Shin (Yonsei University, Korea)

Session A4-1 Comparative analysis of multi-loss functions for enhanced multi-modal speech emotion recognition

Phuong-Nam Tran and Thuy-Duong Thi Vu (FPT University, Vietnam); Nhat Truong Pham (Sungkyunkwan University, Korea (South)); Hanh Dang-Ngoc (VNU-HCMC University of Technology, Vietnam & University of Technology Sydney, Australia); Duc Ngoc Minh Dang (FPT University, Ho Chi Minh, Vietnam)

Session A4-2 RBBA: ResNet - BERT - Bahdanau Attention for Image Caption Generator

Duc-Hieu Hoang (Ton Duc Thang University, Vietnam); Duc Ngoc Minh Dang (FPT University, Ho Chi Minh, Vietnam); Hanh Dang-Ngoc (VNU-HCMC University of Technology, Vietnam & University of Technology Sydney, Australia); Anh-Khoa Tran, Phuong-Nam Tran and Cuong Tuan Nguyen (FPT University, Vietnam)

Session A4-3 A segmentation approach to regression problems with switching-points

Shao-Tung Chang (National Taiwan Normal University, Taiwan); Kang-Ping Lu (National Taichung University of Science and Technology, Taiwan)

Session A4-4 Visual-Based Deep Reinforcement Learning for Mobile Robot Obstacle Avoidance Navigation

Zhiyuan Nan and Haewoon Nam (Hanyang University, Korea (South))

Session A4-5 Deep Learning-Based Anomaly Detection using Hybrid Loss

Michael Onyekwelu, Mingyu Jang and Dongweon Yoon (Hanyang University, Korea (South))

Session A4-6 Robust Approach for Lumen Segmentation Approach in IVUS Image using Deeply Learn U-net Model

Watcharaphong Yookwan, Ratanak Khoeun, Kamal Baha, Athitha Onouen, KPusit Kulkasem and Krisana Chinnasarn (Burapha University, Thailand)

[Session B4] Wireless 2

Oct. 12, 08:30~10:00

Chair : Prof. Intae Hwang (Chonnam Nat'l University, Korea)

Session B4-1 An improved demodulation method for image sensor based visible light communication using sparse estimation technique

Yuki Ohira (Nagaoka University of Technology & Sumitomo Heavy Industries, Ltd., Japan); Tomohiro Yendo (Nagaoka University of Technology, Japan)

Session B4-2 UAV Based Optimized Virtual Cooperative Sensing Using Particle Swarm Optimization

Noor Gul (University of Peshawar & Tech University of Korea, Pakistan); Su Min Kim (Tech University of Korea, Korea (South)); Jehad Ali (Ajou University, Korea (South)); Junsu Kim (Tech University of Korea, Korea (South))

Session B4-3 Continuous Steering Backups of NLoS-Assisted mmWave Networks to Avoid Blocking

Rafid I. Abd and Kwang Soon Kim (Yonsei University, Korea (South))

Technical Paper Sessions

Session B4-4 Enhanced Deep Cooperative Q-Learning for Optimized Vehicle-to-Vehicle Communication in 5G/6G Networks
Tahir H. Ahmed (Multimedia University, Malaysia); Azwan Mahmud (Multimedia University & Telekom Malaysia, Malaysia); Azlan Abd Aziz (Multimedia University, Melaka, Malaysia); Syamsuri Yaakob (Universiti Putra Malaysia, Malaysia)

Session B4-5 Evaluation of Effect of Congestion on Time Synchronization Accuracy in IEEE 802.1AS
Yohei Ozawa and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Session B4-6 Intelligent O-RAN-Based Proactive Handover in Vehicular Networks
Eshita Rastogi (Sungkyunkwan University, Korea (South)); Mukesh Kumar Maheshwari (Bahria University, Pakistan); Jaehoon Jeong (Sungkyunkwan University, Korea (South))

[Session C4] ICTC Workshop on 6G Core Network (IW6GN)

Oct. 12, 08:30~10:00

Chair : Prof. Yun Won Chung (Soongsil University, Korea)

Session C4-1 Delay Optimization for Augmented Reality Service using Mobile Edge Computing Federation System
Huong Mai Do and Myungsik Yoo (Soongsil University, Korea (South))

Session C4-2 REMS: Resource-Efficient and Adaptive Model Selection in 5G NWDAF
Hyeonjae Jeong (Korea University, Korea (South)); Haneul Ko (Kyung Hee University, Korea (South)); Sangheon Pack (Korea University, Korea (South))

Session C4-3 Traffic-Efficient Split Computing Mechanism for Internet of Things
Hojin Yeom and Haneul Ko (Kyung Hee University, Korea (South)); Sangheon Pack (Korea University, Korea (South))

Session C4-4 A UAV-Assisted Handover Scheme for Coverage Maximization against 5G Coverage Holes
Hyeonah Jung (SKKU, Korea (South)); Eshita Rastogi and Jaehoon Jeong (Sungkyunkwan University, Korea (South))

Session C4-5 A Design of Infrastructure Backup System for Private 5G Networks
Ha Duong Phung, Thang Tran Huy and Young Han Kim (Soongsil University, Korea (South))

Session C4-6 Supporting ICN in 5G Core Network
Min Wook Kang and Yun Won Chung (Soongsil University, Korea (South))

[Session D4] ICTC Workshop on Quantum Internet (IWQI, Special Session for ITRC, Korea University)

Oct. 12, 08:30~10:00

Chair : Prof. Jun Heo (Korea University, Korea)

Session D4-1 Delayed-choice quantum erasure using Poisson-distributed photons
Sangbae Kim and Byoung Seung Ham (Gwangju Institute of Science and Technology, Korea (South))

Session D4-2 Mobility Robustness Optimization for Self-Organizing Networks: A Deep Reinforcement Learning Approach
Kihoon Kim and Eunsok Lee (University of Korea, Korea (South)); Sangheon Pack (Korea University, Korea (South))

Session D4-3 Experimental Analysis of a Time-Dependent FSO System under Summer Conditions in South Korea
Tae-In Oh, Jong-Min Kim, Min-Ji Lee and Young-Chai Ko (Korea University, Korea (South))

Technical Paper Sessions

Session D4-4 Design of quantum approximate optimization algorithm for graph multi coloring problem
Gunsik Min and Jun Heo (Korea University, Korea (South))

Session D4-5 Symmetry Verification and Circuit Implementation using Qiskit
Youshin Chung, Jinyoung Ha, Yujin Kang and Jun Heo (Korea University, Korea (South))

Session D4-6 A Reduced Complexity Method of Recursive Quantum Approximate Optimization Algorithm
Youngjin Seo and Jun Heo (Korea University, Korea (South))

[Session E4] ICTC Workshop on Big Data (IWBD) 1

Oct. 12, 08:30~10:00

Chair : Prof. Jeongyeup Paek (Chung-Ang University, Korea)

Session E4-1 Preprocessing Taste Data for Deep Neural Networks
Hyunjong Lee, Han Hee Jung, Junwoo Yea, Kyung-In Jang and Jeongho Kwak (DGIST, Korea (South)); Jihwan P. Choi (Korea Advanced Institute of Science and Technology, Korea (South))

Session E4-2 A Recent Reinforcement Learning Trend for Vehicular Ad Hoc Networks Routing
Woongsoo Kim, Junhong Min, Yongseok Son and Jeongyeup Paek (Chung-Ang University, Korea (South))

Session E4-3 Multi-Connection Scheduling for Resource Fairness in Bluetooth Low Energy Networks
Moonbeom Kim and Jeongyeup Paek (Chung-Ang University, Korea (South))

Session E4-4 Mimicking GFSK Modulation for WiFi-to-BLE Cross Technology Communication
Chaeyeong Lee, Moonbeom Kim, Sungrae Cho and Jeongyeup Paek (Chung-Ang University, Korea (South))

Session E4-5 Unified Framework for End-User Authentication Protocol in Feature-as-a-Service Models
Jaehyung Ahn, Junhong Min, Hyung Tae Lee and Jeongyeup Paek (Chung-Ang University, Korea (South))

Session E4-6 Iterative Closest Point of Object-based Point Clouds for Multi-View Extension
Junhyeong Ryu (Chung-Ang University, Korea (South)); Christina Suyong Shin (USC, USA); Jeongyeup Paek (Chung-Ang University, Korea (South))

[Session F4] ICTC Workshop on SCSS (IWSCSS) 1

Oct. 12, 08:30~10:00

Chair : Prof. Howon Lee (Hankyong Nat'l University, Korea)

Session F4-1 Challenges in 6G Multi-Satellite Conncetivity
Jorge Querol (University of Luxembourg, Luxembourg)

Session F4-2 On Architecting LEO Mega-Constellation Networks
Jihwan P. Choi (Korea Advanced Institute of Science and Technology, Korea (South))

Session F4-3 An Adaptive Frame-based Age-aware Access Scheme for Time-Critical Satellite-IoT
Huiyang Xie, Zhenyu Cao, Shilun Song, Junhui Jiang, Sang-Woon Jeon and Hu Jin (Hanyang University, Korea (South))

Session F4-4 Space-Time Block Code Based Cooperative Physical Layer Security Schemes for LEO Satellite Systems
Hyein Lee and Sooyoung Kim (Jeonbuk National University, Korea (South))

Session F4-5 Spectrum Sharing Method in Satellite and Terrestrial Coexisting Networks
Hyunwoo Jung (University of Science and Technology & Electronics and Telecommunications Research Institute, Korea (South)); Jung-Bin Kim (ETRI - Electronics & Telecommunications Research Institute, Korea (South))

Technical Paper Sessions

[Session P4] Poster Session 4

Oct. 12, 08:30~10:00

Chair : Prof. Jeonghun Park (Yonsei University, Korea)

Session P4-1 Marmot: a Light-weight Secure SRv6 Header Authentication System
Sae Hyong Park (Electronics and Telecommunications Research Institute, Korea (South)); Namseok Ko (ETRI, Korea (South))

Session P4-2 The Study on SRv6 for User Plane in 5G-Advanced and 6G Mobile Networks
Jongseok Lee (Electronics and Telecommunications Research Institute, Korea (South)); Sunjin Kim and Namseok Ko (ETRI, Korea (South))

Session P4-3 A Solution for Establishing Traffic Routes per Application in 5G-Advanced and 6G Mobile Networks
Sunjin Kim (ETRI, Korea (South)); JongSeok Lee (Electronics and Telecommunications Research Institute, Korea (South)); Namseok Ko (ETRI, Korea (South))

Session P4-4 An Architecture of Programmable Network based on Adaptive SRv6 Policy
HyunKyung Yoo and SungHyuk Byun (Electronics and Telecommunications Research Institute, Korea (South)); Sunhee Yang (Electronics and Telecommunication Research Institute, Korea (South)); Namseok Ko (ETRI, Korea (South))

Session P4-5 Energy-efficient UAV-based Edge Computing Systems for XR Applications
Jaewoo Jung (Kyungpook National University, Korea (South)); Seongah Jeong (Kyungpook National University & School of Electronics Engineering, Korea (South))

Session P4-6 Adaptive Control of Congestion Window in QUIC
So-Yong Kim (Kyungpook National University, Korea (South)); Seok-Joo Koh (Kyungpook National University & College of IT Engineering, Korea (South))

Session P4-7 Edge Media Server for Real-Time 4K Video Streaming with Multiple 5G-Enabled Drones
Jae-Kwan Yun, MoonSoo Lee and ChaeDeok Lim (ETRI, Korea (South))

Session P4-8 Jamming Power Optimization for Data Freshness in Covert Relay Networks
Seungmin Sim (Sungkyunkwan University, Korea (South)); Jinwoong Kim (DGIST, Korea (South)); Jemin Lee (Sungkyunkwan University (SKKU), Korea (South))

Session P4-9 Design of Cloud-based remote collaborative system for broadcasting production workflow
Soon Kim, Jae-young Lee and Hye-Ju Oh (Electronics and Telecommunications Research Institute, Korea (South))

Session P4-10 Heat Energy Data based Energy Efficiency and Error Detection Service in Complex Apartment
Chang-Sic Choi, Tai-Yeon Ku and Wan-Ki Park (ETRI, Korea (South))

Session P4-11 Intelligent Anomaly Detection System for Critical Network Infrastructure
Boo Geum Jung, Jinhyik Yim, Yoon-Sik Yoo, KangWoon Hong, Jongkuk Lee and HeaSook Park (ETRI, Korea (South))

Session P4-12 Experimental demonstration of virtual OLT-based PON slicing for co-existence of different services
ChanSung Park (ETRI, Korea (South)); YongWook Ra (Electronics and Telecommunications Research Institute, Korea (South)); HwanSeok Chung (ETRI, Korea (South))

Session P4-13 Zero Trust Black Network Access for Mobile Broadband Mission-Critical Services
Boo Geum Jung, Yoon-Sik Yoo, Jinhyuk Yim, KangWoon Hong, Jongkuk Lee and HeaSook Park (ETRI, Korea (South))

Technical Paper Sessions

Session P4-14 Cryptanalysis and Countermeasures of the Recent Authentication and Key Agreement Scheme for Internet of Drones
SungJin Yu (Electronics and Telecommunications Research Institute, Korea (South)); Keonwoo Kim and Taesung Kim (ETRI, Korea (South)); Boheung Chung (Electronics and Telecommunications Research Institute, Korea (South)); Yousung Kang (ETRI, Korea (South))

Session P4-15 A Packet Processing Scheme in 5G MAC Protocol Using DPDK
Jae-Su Song and Heesang Chung (ETRI, Korea (South))

Session P4-16 Study on Device Based Geo-fencing and Triggering Services for Enhancing Alert Area Accuracy in Cell Broadcast Service
Hyunjoo Kang, Seung-Hee Oh and Sang-Lim Ju (ETRI, Korea (South))

Session P4-17 Addressing Timely AI Technology Standardization Challenges through a Hierarchical Analysis Approach
Daejung Kim (Telecommunications Technology Association, Korea (South)); Bora Jeon (TTA, Korea (South)); Kyoung Cheol Koo (Telecommunication Technology Association, Korea (South))

Session P4-18 DR based Sentence & SPO Tuple Pair Generation for Open Information Extraction
Joonyoung Jung and Dong-oh Kang (ETRI, Korea (South))

Session P4-19 Development of Wireless Communication System for LTE-R based Train Control
Byungsik Yoon, Sookjin Lee and Sangchul Oh (ETRI, Korea (South)); Sungchan Lee and Dongil Sung (Korea Railway Network Authority, Korea (South))

Session P4-20 DAQS: Dynamic and Accurate QoS for SR-IOV
Sungmin Kang (SungKyunKwan University, Korea (South)); Joonyong Hwang and Younghoon Kim (Sungkyunkwan University, Korea (South))

Session P4-21 Harm of Giants in Cloud Computing Market
Kure Chel Lee, Yoon-Ho Choi and Ki Duck Kim (ETRI, Korea (South))

Session P4-22 An efficient network operation automation scheme using network status information for local 5G network
Mahnsuk Yoon (Gumi Electronics & Information Technology Research Institute, Korea (South)); Jihun Seo (Korea Transport Institute, Korea (South)); Kyucheol Cho (Kyungpook National University, Korea (South))

Session P4-23 Security enhancement scheme for mobile device using H/W cryptographic module
Seungyong Yoon (ETRI, Korea (South)); Byoungkoo Kim (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Yousung Kang (ETRI, Korea (South))

Session P4-24 Image Classification on Resource-Constrained Microcontrollers
Seungtae Hong, Gunju Park and Jeong-Si Kim (Electronics and Telecommunications Research Institute, Korea (South))

Session P4-25 An Analysis of Network Performance Requirements for Industrial IoT Services based on 5G Non-Public Network in Smart Energy
Sookhyun Jeon (TTA, Korea (South)); JaeSeung Song (Sejong University, Korea (South)); Younghyun Kim (Korea Electric Power Corporation, Korea (South)); Ji-Myong Kim (TTA, Korea (South))

Session P4-26 Secure Dimensionality Reduction: Applying Linear Discriminant Analysis over the TFHE Homomorphic Encryption Scheme
Geonwoo Jeon, Joon Soo Yoo, Baekkyung Song, Mi Yeon Hong and Ji Won Yoon (Korea University, Korea (South))

Technical Paper Sessions

Session P4-27 An Investigation into the Correlation Between MRI Preprocessing and Performance of Alzheimer's Disease Classification CNN Model
Hyeon Sung Cho (Electronics and Telecommunications Research Institute, Korea (South)); Jae-chan Jeong (ETRI, Korea (South)); Hyo Bong Hong (Electronics and Telecommunications Research Institute, Korea (South), Korea (South))

Session P4-28 Study on WiFi-based Indoor Positioning Prediction using Machine Learning Techniques
Kyonghyun Park, Tangkoo Lee, Seonghun Seo, Min Jung Kim, Giyoung Lee, Daesub Yoon and JaeJun Yoo (ETRI, Korea (South))

Session P4-29 VATMAN: Video-Audio-Text Multimodal Abstractive Summarization with Trimodal Hierarchical Multi-head Attention
Doosan Baek, Jiho Kim and Hongchul Lee (Korea University, Seoul, Korea (South))

Session P4-30 An Analysis of CFAR Thresholds and Scale Factors with Window Effects in Pulse Compression
Kyoungchan Seo and Junho Song (Agency for Defence Development (ADD), Korea (South)); Jong-Mann Kim (Pohang University of Science and Technology, Korea (South)); Jegyung Son (Kyungpook National University, Korea (South))

Session P4-31 New AMR(Automatic Modulation Recognition) algorithm based on the phase difference tendency of unknown communication signal
Chung-Sup Kim and Hyuk-Je Kim (ETRI, Korea (South)); Sung-Woong Choi (Electronics and Telecommunications Research Institute, Korea (South)); Kwan-Woong Ryu and Jun-Seok Kim (ETRI, Korea (South))

Session P4-32 Wheat Diseases Recognition Using Optimal Features Assisted Modified Soft Attention Network
Muhammad Nadeem (Sejong Uviversity, Korea (South)); Aqib Khan (Islamia College Peshawar & DIP LAB, Pakistan); Ji-Won Kim (Sejong University, Korea (South)); L. Minh Dang (Sejong Uviversity, Korea (South)); Hyeonjon Moon (Sejong University, Korea (South))

[Session A5] Networks 2

Oct. 12, 10:20~11:50

Chair : Prof. Jaehoon (Paul) Jeong (Sungkyunkwan University, Korea)

Session A5-1 QoS Estimation of In-vehicle Ethernet with CBS and TAS by Multiple Regression Analysis
Honoka Awane and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Session A5-2 QoS Comparison of ATS and CBS in IEEE 802.1TSN over In-Vehicle Ethernet Based on Automotive Use Case
Akari Yoshimura and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Session A5-3 Study on Effect of Variable Traffic on QoS of ATS and TAS in IEEE 802.1TSN on In-Vehicle Ethernet
Akari Yoshimura and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Session A5-4 A study of a new routing scheme for QoS improvement using SDN
Hayato Ito and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Session A5-5 Quantitative Evaluation of Effectiveness of FramePreemption in IEEE 802.1TSN on QoS over In-Vehicle Ethernet
Honoka Awane and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Session A5-6 A Proposal of Throughput-Based MPTCP Scheduler for WebQoE Improvement
Takeshi Kato and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

Technical Paper Sessions

Session A5-7 Automation Testing with Appium Framework in IP Multimedia Subsystem
Hieu Minh Tran, Thinh Duc Tran, Linh Duc Nguyen, Tuan Duc Ninh and Vuong Van Ngo (Viettel High-Technologies Industries Corporation, Vietnam)

[Session B5] Mobility 1

Oct. 12, 10:20~11:50

Chair : Prof. Hyun Jong Yang (Pohang University of Science and Technology, Korea)

Session B5-1 Deep Learning with Historical Features and Timewise Similarity for Multiple Objects Tracking
Tuan Manh Tao, Changha Lee, Minsu Jeon and Chan-Hyun Youn (Korea Advanced Institute of Science and Technology, Korea (South))

Session B5-2 Comparison of TDOA Positioning Solutions in 5G Network: Indoor and Outdoor Performance
Jiaqi Li and Seung-Hoon Hwang (Dongguk University, Korea (South))

Session B5-3 Line Tracking Delivery Robot Using Wi-Fi-based Indoor Positioning
Su-ji Lee, Ji-Yun Han, Gyu-Bin Kim, In-Seon Hwang and Jae-Young Pyun (Chosun University, Korea (South))

Session B5-4 Partitioning Traffic Engineering in Software Defined Wide Area Networks
Yufeng Xin and Yifei Wang (University of North Carolina at Chapel Hill, USA)

Session B5-5 A Dynamic Traffic Lights Controlling Combined with Vehicle Routes Planning Solution for Alleviating Traffic Congestion
Changhao Fan, Chunxiao Li and Chunyan Qi (Yangzhou University, China)

Session B5-6 Trends and Applications of Robotics Development in Virtual Environments
Joon Young Kim (Sungshin Women's University, Korea (South)); Jeong Min Oh (Sungshin Women University, Korea (South))

[Session C5] ICTC Workshop on Emerging Topics in Wireless Communications (IWETWC)

Oct. 12, 10:20~11:50

Chair : Prof. Oh-Soon Shin (Soongsil University, Korea)

Session C5-1 Clustering-Beamforming Algorithm for Security Performance in Multiple Flying RISs-supported Systems
Yuna Sim, Seungseok Sin and Jihun Cho (Chonnam National University, Korea (South)); Kyunam Kim (Alps Electric Korea Company Limited, Korea (South)); Huaping Liu (Oregon State University, USA); Jihyung Kim (ETRI, Korea (South)); Sangmi Moon (Korea Nazarene University, Korea (South)); Intae Hwang (Chonnam National University, Korea (South))

Session C5-2 Optimization of IRS-assisted OFDMA SWIPT Systems with Dynamic Subcarrier Allocation and AC Computing
Binh-Minh Vu and Oh-Soon Shin (Soongsil University, Korea (South))

Session C5-3 Heterogeneous Wireless Device Management in Edge Computing Systems for IoT Services
Mefeni Vitumbiko and Younghan Kim (Soongsil University, Korea (South))

Technical Paper Sessions

Session C5-4 Weighted Tensor Robust Principal Component Analysis to Reduce Noise in Wireless Sensor Networks
Hanh Hong-Phuc Vo and Myungsik Yoo (Soongsil University, Korea (South))

Session C5-5 Sum-Rate Maximization for RSMA-Enabled Energy Harvesting Aerial Networks With Reinforcement Learning
Jaehyup Seong and Mesut Toka (Ajou University, Korea (South)); Wonjae Shin (Korea University, Korea (South))

Session C5-6 Phase Shift Optimization for RIS Element-Based Index Modulation
Krisma Asmoro and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

[Session D5] ICTC Workshop on KETI International Collaborative R&D Projects (IWKETI)

Oct. 12, 10:20~11:50

Chair : Dr. Kyoung-Taek Lee (Korea Electronics Technology Institute, Korea)

Session D5-1 Rail Camera: An Edge Resource Management for Smart Farm Application
Seungwoo Kum (Korea Elecronics Technology Institute, Korea (South)); Youngkee Kim, Seungtaek Oh and Jaewon Moon (Korea Electronics Technology Institute, Korea (South)); Alejandro Barrera Carvajal (CT Engineering Group, Spain); Francisco Andres Perez (CT Engineering, Spain)

Session D5-2 CLIMB: Computational Lane Identification using Multi-Objective Bayesian Optimization
Taehyeon Kim, Seho Park and Kyungtaek Lee (Korea Electronics Technology Institute, Korea (South))

Session D5-3 Empirical Study: Monocular Depth Estimation from RGB, NIR, Thermal Image in Adverse Weather Conditions
Ukcheol Shin (Carnegie Mellon University, USA); Soonmin Hwang (Hanyang University, Korea (South)); Jean Oh (Carnegie Mellon University, USA)

Session D5-4 Digital Human Interaction Based on Mono Camera for Digital Twin
Myeongseop Kim, Taehyeon Kim and Kyung-Taek Lee (Korea Electronics Technology Institute, Korea (South))

Session D5-5 Accurate Pose Estimation Method using ToF-Stereo Camera Data Fusion
Sukwoo Jung (Korea Electronics Technology Institute, Korea (South)); Harrison Yun (Deutsche TelekomAG, Germany); Kyung-Taek Lee (Korea Electronics Technology Institute, Korea (South))

Session D5-6 Robot-based Object Pose Auto-annotation System for Dexterous Manipulation
Sunme Park, Yujin Kim and Seungwon Lee (Korea Electronics Technology Institute, Korea (South)); Mingi Jung (Korea Electronics Technology Institute (KETI), Korea (South)); Jongbum Park (Korea Electronics Technology Institute, Korea (South))

Session D5-7 Development of Visual and Tactile based Human Behavior Imitation Learning Platform
Jongbum Park and Seungwon Lee (Korea Electronics Technology Institute, Korea (South)); Mingi Jung (Korea Electronics Technology Institute (KETI), Korea (South)); Sunme Park and Yujin Kim (Korea Electronics Technology Institute, Korea (South))

Session D5-8 Scenario Design and Research for the Development of Virtual Space Collaboration Services in an Industrial Field
Jihye Jeon (STANS, Korea (South)); Minjae Seo, Dahyun Kong, Chanwoo Kim and Jinyoung Heo (STANS, Inc., Korea (South)); Jongho Paik (Seoul Women's University, Korea (South))

Technical Paper Sessions

[Session E5] ICTC Workshop on Big Data (IWBD) 2

Oct. 12, 10:20~11:50

Chair : Prof. Sungrae Cho (Chung-Ang University, Korea)

Session E5-1 MagSafe accessory classification using magnetometer
Jaemin Choi, Insu Kim, Suhyeon Shin, JunSeob Kim, Sungrae Cho, Mucheol Kim and Hyosu Kim (Chung-Ang University, Korea (South))

Session E5-2 Back-of-device tap recognition by leveraging magnetometer in commodity smartphones
Insu Kim, Jaemin Choi, Suhyeon Shin, JunSeob Kim, Mucheol Kim, Sungrae Cho and Hyosu Kim (Chung-Ang University, Korea (South))

Session E5-3 A Review on AI-Enabled Congestion Control Schemes for Content Centric Networks
Arooj Masood (Chung-Ang University, Korea (South)); Nhu-Ngoc Dao (Sejong University, Korea (South)); Hyosu Kim, Yongseok Son, Hyung Tae Lee, Jeongyeup Paek and Sungrae Cho (Chung-Ang University, Korea (South))

Session E5-4 UAV-Satellite Integration for Communication System: Potential Applications and Key Challenges
Quang Tuan Do, Anh-Tien Tran, Demeke Shumeye Lakew, Hyosu Kim, Yongseok Son, Hyung Tae Lee, Jeongyeup Paek and Sungrae Cho (Chung-Ang University, Korea (South))

Session E5-5 Surface-Assisted In-Air Gesture Recognition
Minhyeok Kim, Donghun Lee and Hyosu Kim (Chung-Ang University, Korea (South))

Session E5-6 Experimental Analysis of the Recent Key Recovery Protocol with respect to Commitment Schemes
Seongbong Choi, Yongseok Son, Jeongyeup Paek and Hyung Tae Lee (Chung-Ang University, Korea (South))

[Session F5] ICTC Workshop on SCSS (IWSCSS) 2

Oct. 12, 10:20~11:50

Chair : Prof. Bang Chul Jung (Chungnam Nat'l University, Korea)

Session F5-1 Towards 6G Non-Terrestrial Networks- A Perspective from Internet of Things Use-Cases
Joan A. Ruiz-de-Azua (Director of Space Communications Research Group, i2CAT Foundation, Spain)

Session F5-2 Satellite Communication Technology and Future
Jae-Hyun Kim (Ajou University, Korea (South))

[Session P5] Poster Session 5

Oct. 12, 10:20~11:50

Prof. Hoki Baek (Kyungpook Nat'l University, Korea)

Session P5-1 Study on the Possibility of Advancement for Shipyard Workplace Safety Management System Using Drone Images
Yoonsook Hwang (Intelligent Robotics Research Division, ETRI, Korea (South)); Woo-Sung Jung (ETRI, Korea (South)); Dae Seung Yoo (Electronics and Telecommunications Research Institute, Korea (South))

Session P5-2 A Study on Improving the EDISON Data Registration Process Based on Dynamic Design
Sunggeun Han and Jeongcheol Lee (Korea Institute of Science and Technology Information, Korea (South)); Hoon Choi (Chungnam National University, Korea (South))

Technical Paper Sessions

Session P5-3 Design of an Architecture for Interoperability between heterogeneous Metaverse platforms
Heeyoung Jung (Electronics and Telecommunications Research Institute, Korea (South))

Session P5-4 Study on Modeling Formalism and Co-simulation for the System-level Test of Maritime Components
Jeongsik Kim and Woo-Sung Jung (ETRI, Korea (South)); Namhun Kim (UNIST, Korea (South))

Session P5-5 A Microservice-based MLOps Platform for Efficient Development of AI Services in an Edge-Cloud Environment
Chorwon Kim, Geun-Yong Kim and Sungchang Kim (ETRI, Korea (South))

Session P5-6 Design Issues in Implementation of Decentralized AI-data commons Framework
Young-Ho Suh, Sungpil Woo and Boyun Eom (ETRI, Korea (South)); Dong-Hwan Park (Electronics and Telecommunications Research Institute, Korea (South)); Sunhwan Lim (ETRI, Korea (South)); Chan-Won Park (Electronics and Telecommunications Research Institute, Korea (South))

Session P5-7 ADA: Augmented-Reality Development Adaptor for Supporting AR glass
Heeyoon Jeong, Yeseul Son, Yoonmo Yang and Kwang-Soon Choi (Korea Electronics Technology Institute, Korea (South))

Session P5-8 Prompt-Based Segmentation and Inpainting: A New Approach to Disaster Image Creation
Minji Choi and Ru-Bin Won (University of Science and Technology, Korea (South)); Ji Hoon Choi (ETRI, Korea (South)); Byungjun Bae (Electronics and Telecommunications Research Institute, Korea (South))

Session P5-9 Simulation of User Arrangement in Virtual Reality for Design Metaverse Network : Focus On Statistical Distribution
Sangwon Oh, Ibrahim Aliyu and Tai-Won Um (Chonnam National University, Korea (South)); Il-Kwon Jeong and Cho-Rong Yu (Electronics and Telecommunications Research Institute, Korea (South)); Jinsul Kim (Chonnam National University, Korea (South))

Session P5-10 Segmentation-based masked sampling for text-to-animated image synthesis in disaster scenario
Ru-Bin Won and Minji Choi (University of Science and Technology, Korea (South)); Ji Hoon Choi and Byungjun Bae (Electronics and Telecommunications Research Institute, Korea (South))

Session P5-11 A study on visual attention for measuring responsiveness in online performance environment
Taehyeong Kim, Wonkuk Boo, Ryongha Kim and Daehwan Kim (University of Ulsan, Korea (South)); Yongwan Kim (Electronics and Telecommunications Research Institute, Korea (South)); Jinsung Choi (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Ki-Hong Kim (Electronics and Telecommunications Research Institute, Korea (South))

Session P5-12 A Study of W-band FMCW Radar System in 65-nm CMOS technology for W-band Level Sensor
Soo-Jeong Kim, Kwang-Ho Ahn, Soo-Chang Chae and Ki-Jin Kim (Korea Electronics Technology Institute, Korea (South))

Session P5-13 A Study on Prototype Jammer System
KangWoon Hong, Jong-Kook Lee and Hea-Sook Park (ETRI, Korea (South))

Session P5-14 A Design of 80 GHz Cascode LNA for W-Band Level Sensing System
Chung Geun Jang, Ki-Jin Kim, Kwang-Ho Ahn and Soo-Chang Chae (Korea Electronics Technology Institute, Korea (South))

Session P5-15 Proposal of Descriptive Approach for XR Device Sensor Data Handling and Compatibility
Yeseul Son, Yoonmo Yang, Heeyoon Jeong and Kwang-Soon Choi (Korea Electronics Technology Institute, Korea (South))

Session P5-16 Modeling and Performance Evaluation of 6-Axis Robot Attitude Sensor
Wonpil Yu (Electronics and Telecommunications Research Institute, Korea (South)); Song Li (ETRI, Korea (South))

Technical Paper Sessions

Session P5-17 A Smart Speaker Lamp for Assisting Bedtime Smartphone Non-Use: A Feasibility Study
Gyeyoung Jung, Sungsu Kim, Minju Song, Yuju Kang, Jaeyong Lee and Jaejeung Kim (Chungnam National University, Korea (South))

Session P5-18 A Design of High power 65nm CMOS 79GHz Power amplifier
Ji Hye Hwang (Korea Electronics Technology Institute & KETI, Korea (South)); Gwang Ho Ahn, Soo Chang Chae and Ki-Jin Kim (Korea Electronics Technology Institute, Korea (South))

Session P5-19 Fast Bit Inversion Vulnerability Pre-estimation using Tcl and UPF in RTL Simulation Runtime
Myeongjin Kang, Nayoung Kwon and Seungmin Lee (Kyungpook National University, Korea (South)); Daejin Park (Kyungpook National University (KNU), Korea (South))

Session P5-20 A Design of High Resolution ADC-Assisted Gated-Ring Oscillator TDC with Digital Calibration
Na Hyun Kim (SKAIChips, Korea (South)); Dong-Gyu Kim (Sungkyunkwan University, Korea (South)); Kang Yoon Lee (SKAIChips, Korea (South))

Session P5-21 Design of a Drone-Based Real-Time Service System for Facility Inspection
Dong-Wan Ryoo, Moon-Soo Lee and Chae-Deok Lim (ETRI, Korea (South))

Session P5-22 Characteristics of Slant Path Loss according to Frequency and Elevation Angle by Clutters
Youngkeun Yoon (Electronics and Telecommunications Research Institute, Korea (South)); Ho-Kyung Son (ETRI, Korea (South))

Session P5-23 Robust modelling data series with abrupt structure changes at unknown places
Kang-Ping Lu (National Taichung University of Science and Technology, Taiwan); Shao-Tung Chang (National Taiwan Normal University, Taiwan)

Session P5-24 Development of Cloud-Edge Cluster Framework based on Microservice Architecture
Jongbin Park (Korea Electronics Technology Institute, Korea (South) & KETI, Korea (South))

Session P5-25 A Design of Low Noise InP HEMT LNA based on device modeling
Ji-Seung Seo, Kwang-Ho Ahn, Soo-Chang Chae and Ki-Jin Kim (Korea Electronics Technology Institute, Korea (South))

Session P5-26 Lightweighted Shallow CTS Techniques for Checking Clock Tree Synthesizable Paths and Optimizing Clock Tree in RTL Design Time
Nayoung Kwon (Kyungpook National University, Korea (South)); Daejin Park (Kyungpook National University (KNU), Korea (South))

[Session A6] Blockchains

Oct. 12, 13:00~14:30

Chair : Prof. DoHyeun Kim (Jeju Nat'l University, Korea)

Session A6-1 A Blockchain-based Trustworthy and Secure Review System for Decentralized e-Portfolio Platforms
Mpyana Mwamba Merlec (Korea University, Korea (South)); Nday Kabulo Sinai (Korea University, Korea (South)); Hoh Peter In (Korea University, Korea (South))

Session A6-2 Andaman Token: A Feasibility Study of Blockchain Adoption in the Tourism Industry
Warodom Werapun (Prince of Songkla University, PHUKET Campus, Thailand); Nattawat Songsom, Tanakan Khongfai, Ayuth Intrapradit and Jakapan Suaboot (Prince of Songkla University, Thailand)

Technical Paper Sessions

Session A6-3 Cybersecurity and Electoral Processes. An Analysis of Block Chain Enabled Biometric Voter System and Risk Control in Kenya's 2022 Electoral Process and the United States Election System Infrastructure
Anteneh Girma and John Irungu (University of the District of Columbia, USA)

Session A6-4 Multi-UAV Employed Secure Parcel Delivery System using Blockchain
Ramdhan Nugraha (Kumoh National Institute of Technology, Korea (South)); Md. Masuduzzaman (Postdoctoral Research Fellow at Kumoh National Institute of Technology, South Korea, Korea (South)); Munkyu Choi and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

Session A6-5 Blockchain and eGovernment Convergence for the Optimization of ODA Activities in Developing Countries: A Scoping Review
Uduakobong Ekanem (Handong Global University & Federal Civil Service, Korea (South)); Yun Seon Kim (Handong Global University, Korea (South))

[Session B6] Wireless 3

Oct. 12, 13:00~14:30

Chair : Prof. Taesoo Jun (Kumoh Nat'l Institute of Technology, Korea)

Session B6-1 A Low-Complexity Iterative Detection algorithm for Uplink Massive MIMO Systems
Imran A. Khoso (Korea University, Seoul, Korea (South)); Chung G. Kang (Korea University, Korea (South))

Session B6-2 Hybrid Beamforming with Blockwise Beam Selection for mmWave Beamspace MIMO systems
Md. Abdul Latif Sarker and Dong Seog Han (Kyungpook National University, Korea (South))

Session B6-3 State-of-the-art Underwater Communication Standard in ISO/IEC JTC1
Shrutika Sinha, Ari Hwang and Eun Tae Won (Kookmin University, Korea (South)); Arto Toppinen (Savonia University of Applied Sciences, Finland); Soo-Hyun Park (Kookmin University, Korea (South))

Session B6-4 Active and passive beamforming based on RWMMSE and Gradient Projection for IRS-aided MU-MISO Systems
Seraphin Kimaryo (Seoul National University of Science and Technology, Korea (South)); Eduard Elias Bahingayi (Muhimbili University of Health and Allied Sciences, Tanzania); Kyungchun Lee (Seoul National University of Science and Technology, Korea (South))

Session B6-5 Deep Denoising Channel Extrapolation for IRS-Assisted OFDM Systems
Mubasher Ahmed Khan (Kyunghee University, Korea (South)); Huijin Kang, Muhammad Awais and Yun Hee Kim (Kyung Hee University, Korea (South))

Session B6-6 Evaluation of Satellite Signal Reception Error by Sky View Factor for QZSS Short Message SS-CDMA Communication System
Hiroto Kita and Hiroshi Oguma (National Institute of Technology, Toyama College, Japan); Suguru Kameda (Hiroshima University, Japan); Noriharu Suematsu (Tohoku University, Japan)

Session B6-7 Hybrid Relay and OIRS-Aided Free Space Optical Communication System with Distributed Computing
Haibo Wang (Southeast University, China); Zaichen Zhang (National Mobile Communications Research Laboratory, Southeast University, China); Yingmeng Ge and Baiping Xiong (Southeast University, China)

Technical Paper Sessions

[Session C6] ICTC Workshop on Vehicle Edge & Cloud Computing (IWVECC)

Oct. 12, 13:00~14:30

Chair : Prof. Ji-Woong Choi (Daegu Gyeongbuk Institute of Science and Technology, Korea)

Session C6-1 Dynamic Load Balancing for Energy-Delay Tradeoff in a Cloud-RSU-Vehicle Architecture
Pyeongjun Choi, Pildo Yoon and Jeongho Kwak (DGIST, Korea (South))

Session C6-2 Paste-and-Cut: Collective Image Localization and Classification for Real-Time Multi-Camera Object Detection
Young Eun Kang, Woosung Kang, Taehun Lee and Hoon Sung Chwa (DGIST, Korea (South))

Session C6-3 Insights into Sidelink Resource Allocation: A Performance Study in 5G NR-V2X
Mahmoud Elsharief (Hanyang University, Korea (South)); Saifur Rahman Sabuj (Hanbat National University, Korea (South)); Han-Shin Jo (Hanyang University, Korea (South))

Session C6-4 V2X Traffic-Load Generator System for Enabling Efficient Vehicle Communication Load-Balancing
Eunju Yang, Geunhan Seo and Sujin Hwang (Korea Intelligent Automotive Parts Promotion Institute, Korea (South)); Bongseob Kim (Korea Intelligent Automotive Parts Promotion Institute & Hanyang univ., Korea (South)); Kyungsu Yun (KIAPI, Korea (South))

Session C6-5 Performance Evaluation of Object Detection Considering C-V2X Communication Errors
Jeeyoo Kim, Donghyeon Kim, Sinuk Choi and Ji-Woong Choi (DGIST, Korea (South))

Session C6-6 Utilization of Path History Data for the Extension of V2X Network Coverage
Zachary Choffin (The University of Alabama, USA); Han-Shin Jo (Hanyang University, Korea (South)); Seongcheol Jeong (Korea Automotive Technology Institute, Korea (South)); Nathan Jeong (The University of Alabama, USA)

[Session D6] ICTC Workshop on ETRI 5G-Adv/6G Technologies (IWETRI)

Oct. 12, 13:00~14:30

Chair : Dr. Ilgyu Kim (Electronics and Telecommunications Research Institute, Korea)

Session D6-1 V2I and V2V service demonstration of millimeter wave communication in urban road environment
Sung-Woo Choi, Heesang Chung and Dae-Soon Cho (ETRI, Korea (South)); Jung-Pil Choi (Mobile Communications Research Lab., Electronics and Telecommunications Research Institute, Korea (South)); Seon-Ae Kim (Electrics and Telecommunications Research Institute, Korea (South)); Junhyeong Kim and Manho Park (ETRI, Korea (South)); Namsuk Lee (Electronics and Telecommunications Research Institute, Korea (South)); Jaesu Song (ETRI, Korea (South)); Nakwoon Sung (Electronics and Telecommunications Research Institute, Korea (South))

Session D6-2 Multiple Control Plane Joint Operation Method under Overlaid Cell Structure Environment for Future Mobile Communications
Soon-Gi Park (Electronics and Telecommunications Research Institute, Korea (South)); Jun-Sik Kim, Sung-Cheol Chang and Yong-Seouk Choi (ETRI, Korea (South)); Young-Jo Ko (Electronics and Telecommunications Research Institute, Korea (South))

Session D6-3 Multi Point Transmission with Channel Conditioned Spatial/Frequency Domain Processing
Chanho Yoon (ETRI, Korea (South)); Woncheol Cho and Young-Jo Ko (Electronics and Telecommunications Research Institute, Korea (South))

Session D6-4 Sub-THz Transmitter Radio Integrated Circuits for Super high-speed 6G Mobile Communications
Bonghyuk Park, Sunwoo Kong, Hui-Dong Lee, Seunghun Wang, Seunghyun Jang and Jung-Hwan Hwang (ETRI, Korea (South))

Technical Paper Sessions

Session D6-5 User Plane Management Function: A Solution for Automatic Deployment of UPF on cloud-native 5G Core Network Architecture
Kieu-Ha Phung and Vu-Dung Luong (Hanoi University of Science and Technology, Vietnam); Quang Tung Thai and Namseok Ko (ETRI, Korea (South))

Session D6-6 Physical Layer Modem Implementation for Movable Wireless Backhaul System
Jang-won Moon (ETRI, Korea (South))

[Session E6] ICTC Workshop on Big Data (IWBD) 3

Oct. 12, 13:00~14:30

Chair : Prof. Hyosu Kim (Chung-Ang University, Korea)

Session E6-1 Survey of Distributed File Systems: Concepts, Implementations, and Challenges
Kiet Tuan Pham, Sangjin Lee, Lan Anh Nguyen, Jeongyeup Paek and Yongseok Son (Chung-Ang University, Korea (South))

Session E6-2 A Survey on File Defragmentation Techniques on Modern Storage Systems
Sangjin Lee, Lan Anh Nguyen and Hyeongi Yeo (Chung-Ang University, Korea (South)); Sunggon Kim (Seoul National University of Science and Technology, Korea (South)); Sungrae Cho and Yongseok Son (Chung-Ang University, Korea (South))

Session E6-3 A Survey on Epoch-based In-Memory Database Systems
Lan Anh Nguyen, Sangjin Lee, Hyung Tae Lee and Yongseok Son (Chung-Ang University, Korea (South))

Session E6-4 Resource Allocation in Multi-Cell Networks: A Deep Reinforcement Learning Approach
Harun Ur Rashid and Seong-Ho Jeong (Hankuk University of Foreign Studies, Korea (South))

Session E6-5 Dual-Band Dual-Sense Polarized Metasurface Antenna with Two-Dimensional Beam Steering Using Surrogate Hinges Origami Reflectors
Syed Imran Shah and Sungjoon Lim (Chung-Ang University, Korea (South))

[Session F6] ICTC Workshop on SCSS (IWSCSS) 3

Oct. 12, 13:00~14:30

Chair : Prof. Jeongho Kwak (Daegu Gyeongbuk Institute of Science and Technology, Korea)

Session F6-1 GNSS Error Correction Techniques for Position Accuracy Enhancemenet
Seongkyun Jeong (Sangmyung University, Korea(South))

Session F6-2 Reflectarray Antenna Technology for LEO Satellite Communication System
Seongmin Pyo (Hanbat National University, Korea(South))

Session F6-3 Metamaterial Lensing Surface for a Weight-Reduced Metal Waveguide Antenna on Satellites
Sungtek Kahng and Jaewon Koh (Incheon National University, Korea (South)); Yejune Seo (Inchoen National University, Korea (South)); Woogon Kim (Incheon National University, Korea (South)); Yeol In Moon (NISSHA & Korea, Korea (South)); Seongbu Seo (Incheon National University, Korea (South))

Session F6-4 A Novel Correlative Interferometer Technique with Multi-Sample Diversity for Finding Direction of Satellites
Young-Seok Lee and Minkyu Oh (Chungnam National University, Korea (South)); InKi Lee (Eletronics and Telecommunications Research Institute, Korea (South)); Bang Chul Jung (Chungnam National University, Korea (South))

Technical Paper Sessions

Session F6-5 Linear Subarrays for Multi-Beam Satellites
Sangbae Oh, Jungjin Shin, Hyojoon Lim and Joongki Park (LIG Nex1, Korea(South)); Heedong Do and Namyoon Lee (Korea University, Korea(South))

[Session P6] ICTC Workshop on SCSS (IWSCSS) Poster

Oct. 12, 13:00~14:30

Chair : Prof. Heejung Yu (Korea University, Korea)

Session P6-1 Selective Carrier Frequency Offsets to a Subgroup of Navigation Satellite Signals under Constant Envelope Multiplexing
Hyoungsoo Lim (Electronics and Telecommunications Research Institute (ETRI), Korea (South))

Session P6-2 A Survey on Doppler Mitigation Approaches in Satellite Communications
Yeonwoong Kim, Junggon Seo, Byungha You and Haejoon Jung (Kyung Hee University, Korea (South)); In-Ho Lee (Hankyong National University, Korea (South)); Jung-Bin Kim (ETRI - Electronics & Telecommunications Research Institute, Korea (South))

Session P6-3 Location-based Trigger Conditions for Handover in Non-Terrestrial Network
Hee Wook Kim (Electrionics and Telecommunications Research Institute, Korea (South)); Joon Gyu Ryu (ETRI, Korea (South))

Session P6-4 Dual-Band Single-Layer Reflectarray Antenna for LEO Satellite Communication
Bagas Satriyotomo and Seongmin Pyo (Hanbat National University, Korea (South))

Session P6-5 Impact of RIS on Outage Probability and Ergodic Rate in Wireless Powered Communication
Waqas Khalid (Korea University & Sejong, South Korea, Korea (South)); Manish Nair (University of Bristol, Bristol, United Kingdom (Great Britain)); Trinh Van Chien (Hanoi University of Science and Technology, Vietnam); Heejung Yu (Korea University, Korea (South))

Session P6-6 RIS Channel Modeling based on 3GPP Channel Model
Jihyung Kim and Juho Park (ETRI, Korea (South)); Jinkyu Kang (Myongji University, Korea (South))

Session P6-7 A Common Phase Error Estimation Scheme with MMSE Equalizer
Juho Park and JunHwan Lee (ETRI, Korea (South)); Moon-Sik Lee (Electronics and Telecommunications Research Institute, Korea (South))

Session P6-8 Service Procedures for On-board UEs in the 3GPP Mobile IAB Systems
Yousun Hwang (ETRI, Korea (South)); Sung-Min Oh (Electronics and Telecommunications Research Institute (ETRI), Korea (South))

Session P6-9 Survey on Protocol Achitectures for Cellular-based Low Earth Orbit Satellite Communications
Yousun Hwang (ETRI, Korea (South)); Sung-Min Oh (Electronics and Telecommunications Research Institute (ETRI), Korea (South))

Session P6-10 Application of Adaptive Polar Code based CV-QKD Scheme for LEO Satellite Systems
Qiang Wang (Yangzhou University, China); Thara Son (Jeonbuk National University, Korea (South)); Meixiang Zhang (Yangzhou University, China); Sooyoung Kim (Jeonbuk National University, Korea (South))

Session P6-11 Patent Trends on Reconfigurable Intelligent Surface
Juho Park and Jihyung Kim (ETRI, Korea (South)); Enkyong Ko (KISTA, Korea (South)); Kyeong Taik Oh and Jae-Eon Oh (COX Patent & Law Firm, Korea (South))

Technical Paper Sessions

Session P6-12 Modeling of Inter-Satellite Link Protocol for Satellite Constellation
Seunghwa Jung, Eugene Bang and Yoola Hwang (ETRI, Korea (South))

Session P6-13 A Network Architecture of NOMA-CDRT based on 3GPP New Radio Standards
GunGoo Lee (University of Science and Technology, Korea (South)); Jung-Bin Kim (ETRI - Electronics & Telecommunications Research Institute, Korea (South))

Session P6-14 Empowering User Capabilities via Non-Orthogonal Multiple Access in 3GPP Non-Terrestrial Networks
Gyeongrae Im and Dong-Hyun Jung (ETRI, Korea (South)); Jung-Bin Kim (ETRI - Electronics & Telecommunications Research Institute, Korea (South)); Joon Gyu Ryu (ETRI, Korea (South))

Session P6-15 A Ka-Band 4-Channel CMOS Beamforming Front-End IC with Built-in Linearizer for Data Relay Satellite System
Seong-Mo Moon and Junhan Lim (ETRI, Korea (South)); Wonseob Lee and Euijin Oh (Chonnam National University, Korea (South)); Dongpil Chang (ETRI, Korea (South)); Jinseok Park (Chonnam National University, Korea (South))

Session P6-16 A Survey of the Applications of Evolutionary Computation in Satellite Domain
Yu Sun, Zhenyu Cao, Shilun Song and Hu Jin (Hanyang University, Korea (South))

Session P6-17 Performance Analysis of Spread Spectrum Random Access for GEO Satellite Communication System
Donghoon Kang and Kahee Han (ETRI, Korea (South)); Hyoungsoo Lim (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Yoola Hwang (ETRI, Korea (South))

Session P6-18 AI-based Algorithm for GNSS Spoofing Detection
Jae Hwan Bong, Doyoung Kim and Seongkyun Jeong (Sangmyung University, Korea (South))

Session P6-19 Visibility and Connectivity Analysis of LEO Satellite Networks under LoRa Protocols
Junse Lee (Sungshin Women's University, Korea (South)); Sooyeob Jung (Electronics and Telecommunication Research Institute (ETRI), Korea (South)); Joon Gyu Ryu (ETRI, Korea (South))

Session P6-20 An Enhancement of the Location-based Measurement Initiation in an Earth-moving Cell
Seungkwon Cho, Mi-young Yun and JunHwan Lee (Electronis and Telecommunications Research Institute, Korea (South))

Session P6-21 Design of 5G Non-Terrestrial Network Handover using Transparent Satellite
Kyung-Rak Lee, Hee-Wook Kim and Joon-Gyu Ryu (ETRI, Korea (South)); Jin-YoungKang (Semicolon, Korea (South))

Session P6-22 L-band Planar Array Antenna with High Efficiency for DCS_VSAT Applications
Soon Young Eom (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Dong Pil Chang (ETRI, Korea (South))

Session P6-23 Performance Evaluation of Location-based Conditional Handover Scheme using LEO Satellites
Jongtae Lee (Ajou University, Korea (South)); Wonjae Lee (Ajou, Korea (South)); Jae-Hyun Kim (Ajou University, South Korea, Korea (South))

Session P6-24 Comparative Analysis on the Resource Allocations for Interference-limited LEO Satellite Systems
Gyuseong Jo and Sooyoung Kim (Jeonbuk National University, Korea (South)); Hee Wook Kim (Electrionics and Telecommunications Research Institute, Korea (South)); Daesub Oh (Electronics and Telecommunications Research Institute, Korea (South));

Session P6-25 MMSE-Based MIMO Receiver for Cooperative Downlink NOMA in LEO Satellite Networks
Jeong Seon Yeom, Yujin Lee and Bang Chul Jung (Chungnam National University, Korea (South))

Technical Paper Sessions

Session P6-26 STAR-RIS-Enabled NOMA with Signal Constellation Adjustment for 6G LEO Satellite Networks
Ju Yeong Baek, Young-Seok Lee and Bang Chul Jung (Chungnam National University, Korea (South))

Session P6-27 Ka-band Compact Phase Shifter Based on Multi-Step and Flip Symmetric Structures
Hakmin Lee, Changsoo Kwak, Manseok Uhm, So-hyeun Yun, Dongpil Chang and Byoung-Sun Lee (ETRI, Korea (South))

Session P6-28 Vision-assisted Beam Prediction for UAV-enabled Millimeter-Wave Communications using SE-ResNet50
Zahra Zarei, Fitsum Debebe Tilahun and Chung G. Kang (Korea University, Korea (South))

Session P6-29 Content Caching and Multi-hop Routing in Low Earth Orbit Satellite Networks
Jeongmin Seo (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Jeongho Kwak (Daegu Gyeongbuk Institute of Science and Technology, Korea (South));

Session P6-30 Dual-Pole 4-Channel Receive Beamforming IC for Ka-band Satellite Communication
Junhan Lim (Electronics and Telecommunications Research Institute, Korea (South)); Seong-Mo Moon (Electronics and Telecommunications Research Institute, Korea (South)); Dong-Pil Chang (Electronics and Telecommunications Research Institute, Korea (South)); Byoung-Sun Lee (Electronics and Telecommunications Research Institute, Korea (South)); Jin-Seok Park (Chonnam National University, Korea (South))

Session P6-31 Comparative Study on mmWave and Terahertz Hotspot Performances
Soihem Gonmei (Seoul National University of Science and Technology, Korea (South)); Junhwan Lee (Electronics and Telecommunications Research Institute, Korea (South)); Taesoo Kwon (Seoul National University of Science and Technology, Korea (South))

Session P6-32 Fronthaul and frame structure optimization for regenerative LEO-based satellite networks
Junseok Lee (Korea University, Korea (South)); Sangho Kim(Korea University, Korea (South)); Heejung Yu (Korea University, Korea (South))

Session P6-33 Multi-User and Multi-Satellite Dynamic Code Offloading Systems
Jeonghwan Kim (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Jeongho Kwak (Daegu Gyeongbuk Institute of Science and Technology, Korea (South));

Session P6-34 Hierarchical QL for Optimal Resource Allocation and UAV Positioning in SAGIN with IAB
Kakyeom Jeon (Hankyong National University, Korea (South)); Howon Lee (Hankyong National University, Korea (South))

Session P6-35 UNPR Uncovered Neighbor-aware Probabilistic Relay-Selection Method in Tactical FANETs
Yerin Lee (Hankyong National University, Korea (South)); Jimin Jeon (Hankyong National University, Korea (South)); Jungwook Choi (LIG Nex1, Korea (South)); Soobum Park (LIG Nex1, Korea (South)); Donggeun Lee (LIG Nex1, Korea (South)); Bang Chul Jung (Chungnam National University, Korea (South)); Howon Lee (Hankyong National University, Korea (South))

Session P6-36 A Terrestrial and Satellite Communications Interworking Scenario for UAM Services
Sung-Min Oh (Electronics and Telecommunications Research Institute, Korea (South)), Yousun Hwang (Electronics and Telecommunications Research Institute, Korea (South))

Session P6-37 RSMA-Based Robust Rate-Matching Framework in Multibeam Satellite Communications
Jaehyup Seong (Ajou University, Korea (South)); Junha Park (Ajou University, Korea (South)); Wonjae Shin (Korea University, Korea (South))

Session P6-38 Traffic-Aware Multilayer Satellite Networks with Rate-Splitting Multiple Access for High Throughput
Jaehak Ryu (Ajou University, Korea (South)); Byungju Lee (Incheon National University, Korea (South)); Wonjae Shin (Korea University, Korea (South))

Technical Paper Sessions

Session P6-39 Fundamental Link Budget Analysis for Low Earth Orbit Satellite Downlink Communications
Soyi Jung (Ajou University, Korea (South)); Joongheon Kim (Korea University, Korea (South)); Jae-Hyun Kim (Ajou University, Korea (South))

Session P6-40 Design of a K-band Beamformer for Receiving Active Phased Array Antennas for Satellite Communications
Duyong Seo (LIG Nex1, Korea (South)); Sangpill Lee (LIG Nex1, Korea (South)); Choongho Song (LIG Nex1, Korea (South)); Moonkyu Cho (Korea National University of Transportation, Korea (South)); Seunghwan Jung (GRIT CIC, Korea (South))

Session P6-41 Design of a Ka-Band Beamformer for Transmitting Active Phased Array Antennas for Satellite Communications
Yeonsu Na (LIG Nex1, Korea (South)); Sangpill Lee (LIG Nex1, Korea (South)); Choongho Song (LIG Nex1, Korea (South)); Moonkyu Cho (Korea National University of Transportation, Korea (South)); Seunghwan Jung (GRIT CIC, Korea (South))

Session P6-42 A New Transmission Strategy for Data Fusion Using High-altitude Platforms
Hyung-Joo Moon (Yonsei University, Korea (South)); Chan-Byoung Chae (Yonsei University, Korea (South))

October 13th (Friday), 2023

[Session A7] IoT 2

Oct. 13, 08:30~10:00

Chair : Prof. Haneul Ko (Kyung Hee University, Korea)

Session A7-1 Air Quality Index Mapping Using Programmable Single Propeller UAV Towards Internet of Drone Things
Nyoman Karna and Muhammad Alfarafi Maulana Firdausa (Telkom University, Indonesia); Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

Session A7-2 Intravascular Ultrasound image Registration based on Geometric Spatial Energy
Watcharaphong Yookwan, Jiranun Sangrueng, Janya Onpans and Supawadee Srikamdee (King Mongkut's Institute of Technology Ladkrabang, Thailand); Krisana Chinnasarn (Burapha University, Thailand)

Session A7-3 Inferring Discussion Topics about Exploitation of Vulnerabilities from Underground Hacking Forums
Felipe Moreno-Vera (UFRJ, Peru)

Session A7-4 Beyond Perspectives: Enhancing Pose Estimation via Viewpoint Transformation
Jung Won Yoon, Hyun Jun Yook, Jae Eun Seo, Jae Hun Choi and Youn Kyu Lee (Hongik University, Korea (South))

Session A7-5 Enhancing Nighttime Vehicle Detection via Transformer-based Data Augmentation
Min Young Lim, Seong Hee Park, Soo-Hyun Lee, Tae Hyung Kim, Dongwoo Kang and Youn Kyu Lee (Hongik University, Korea (South))

Session A7-6 Edge Storage Management Recipe with Zero-Shot Data Compression for Road Anomaly Detection
YeongHyeon Park, Uju Gim and Myung Jin Kim (SK Planet Co., Ltd., Korea (South))

Technical Paper Sessions

[Session B7] IoT 2

Oct. 13, 08:30~10:00

Chair : Prof. Seung- Chan Lim (Hankyong Nat'l University, Korea)

Session B7-1 Orthogonal Time Frequency Space Index Modulation based on Non-Orthogonal Multiple Access

Adnan Tariq (Kumoh National Institute of Technology, Korea (South)); Sajid Muhammad Sarwar (Kumoh National Institute of Technology, Gumi, South Korea, Pakistan); Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

Session B7-2 Orbital Angular Momentum (OAM) in Wireless Communication: Applications and Challenges Towards 6G

Huan Zhang, Zhenyu Cao, Huiyang Xie and Hu Jin (Hanyang University, Korea (South))

Session B7-3 STAR-RIS-IM Assisted Constellation Rotation NOMA System

Nadhira Azizah Suwanda, Hye Yeong Lee and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

Session B7-4 A Novel Method in Mobile Subscriber Location Estimation for Enhancement of Paging Procedure in Mobile Cellular Networks

Kieu-Ha Phung (Hanoi University of Science and Technology, Vietnam); Diep Pham Quang (Mobile Switching Technologies Center & Viettel High Technology Corporation, Vietnam); Nguyen Tai Hung (Hanoi University of Technology, Vietnam); Nguyen Huu Thanh, Hung Le-Minh and Phu Tran-Van (Hanoi University of Science and Technology, Vietnam); Hien Van Le (Mobile Switching Technologies Center & Viettel High Technology Corporation, Vietnam); Ngoc Xuan Mai (Mobile Switching Technologies Center, Vietnam & Viettel High Technology Corporation, Vietnam); Tu Minh Le (Mobile Switching Technologies Center, Vietnam)

Session B7-5 GPS Signal Transmission Interval Optimization in Relay-Type GPS

Koki Kurahashi and Takatoshi Sugiyama (Kogakuin University, Japan)

Session B7-6 Spectrum Suppressed Transmission Applied by Higher Coding Rate FEC

Yuki Kurihara and Takatoshi Sugiyama (Kogakuin University, Japan)

Session B7-7 3-Dimensional Drones' Allocation Control Based on Machine Learning in Multi-Hop Wireless Networks

Keisuke Imamura and Takatoshi Sugiyama (Kogakuin University, Japan)

[Session C7] ICTC Workshop on Technologies and Services for Private 5G/6G (IWTSP)

Oct. 13, 08:30~10:00

Chair : Prof. Sangheon Pack (Korea University, Korea)

Session C7-1 Cost-efficient Deployment Scheme for User and Control Plane Functions in Non-public Networks

Yeunwoong Kyung (Kongju National University, Korea (South)); Jaewook Lee (Pukyong National University, Korea (South)); Seokwon Jang (Electronics and Telecommunications Research Institute, Korea (South)); Haneul Ko (Kyung Hee University, Korea (South)); Taewon Song (Soonchunhyang University, Korea (South))

Session C7-2 Network Data Generation using IP2Vec Embedding

Minji Kim (SungKyunKwan University, Korea (South)); Migyeong Kang and Eunil Park (Sungkyunkwan University, Korea (South)); Sangheon Pack (Korea University, Korea (South)); Jinyoung Han (Sungkyunkwan University, Korea (South))

Technical Paper Sessions

Session C7-3 Towards a Lightweight Object Detection through Model Pruning Approaches
HyeRim Yu (Sungkyunkwan University, Korea (South)); SangEun Lee (Electronics and Telecommunications Research Institute, Korea (South)); Byeongsang Yeo (Pai Media Lab, Korea (South)); Jinyoung Han and Eunil Park (Sungkyunkwan University, Korea (South)); Sangheon Pack (Korea University, Korea (South))

Session C7-4 Opportunistic Task Offloading in UAV-assisted Mobile Edge Computing: A Deep Reinforcement Learning Approach
Taewon Song (Soonchunhyang University, Korea (South))

Session C7-5 Adaptive client training scale orchestration for federated learning
Younghwan Jeong (Dankook University, Korea (South)); Taewon Song (Soonchunhyang University, Korea (South)); Taeyoon Kim (Dankook University, Korea (South))

Session C7-6 The Simulation Study on the Effect of Transmission Error in Split Computing Approach
Jaewook Lee (Pukyong National University, Korea (South)); Keunsoo Ko (Catholic University of Korea, Korea (South)); Haneul Ko (Kyung Hee University, Korea (South))

[Session D7] ICTC Workshop on Intelligent Secure Underwater Communication Technology (IWINSECT)

Oct. 13, 08:30~10:00

Chair : Prof. Namyoon Lee (Korea University, Korea)

Session D7-1 Survey for the Underwater Acoustic Channel Simulation
Hyowon Lee (POSTECH, Korea (South)); Namyoon Lee (Korea University, Korea (South))

Session D7-2 OFDM Simulator for Underwater Acoustic Communications
Seyong Kim and Jeonghun Park (Yonsei University, Korea (South)); Mintaek Oh (KAIST, Korea (South)); Jinseok Choi (Korea Advanced Institute of Science and Technology, Korea (South))

Session D7-3 Analysis of Deep Learning-based MIMO Detectors
Sangbu Yun and Youngjoo Lee (POSTECH, Korea (South))

Session D7-4 Challenges in Secure Underwater Wireless Sensor Network with Fine-grained Access Control
Donghyun Yu (DGIST, Korea (South)); Jemin Lee (Sungkyunkwan University (SKKU), Korea (South))

Session D7-5 On the Performance of Index Modulation in OFDM Systems under Jamming Attacks
Jaewon Yun and Yo-Seb Jeon (POSTECH, Korea (South))

Session D7-6 A Survey on Statistical Channel Modeling for Underwater Acoustic Communications
Mintaek Oh (KAIST, Korea (South)); Jinseok Choi (Korea Advanced Institute of Science and Technology, Korea (South)); Seunghyeong Yoo (Ulsan National Institute of Science and Technology, Korea (South)); Sungyu Kim (Chungnam National University, Korea (South)); Seyong Kim and Jeonghun Park (Yonsei University, Korea (South))

Session D7-7 On the Optimization of an Advanced Encryption Standard Algorithm on Processing-in-Memory
Hyunseob Shin, Seunghyun Lee(Korea University, Korea (South)); Jahyun Koo(DGIST, Korea (South)); Jaeha Kung(Korea University, Korea (South))

Technical Paper Sessions

[Session E7] ICTC Workshop on Evolutionary Computation and Communication Intelligence (IWECCI)

Oct. 13, 08:30~10:00

Chair : Prof. Won- Yong Shin (Yonsei University, Korea)

Session E7-1 Tour Routes Planning with Matrix-based Differential Evolution
PPei-Fa Sun, Jian-Yu Li, Ming-Yu Li, Zhan-Yang Gao, Hu Jin, Sang-Woon Jeon, and Jun Zhang (Hanyang University, Korea (South))

Session E7-2 A Fuzzy Logic-Based Differential Evolution for Energy-Efficient UAV Path Planning
YuKai Wang, Jian-Yu Li, Pei-Fa Sun and Sang-Woon Jeon (Hanyang University, Korea (South))

Session E7-3 Exploration-Aided Downstream Graph Learning Tasks: A Survey on Exploratory Graph Learning
Yu Hou and Won-Yong Shin (Yonsei University, Korea (South))

Session E7-4 Multi-UAV Path Planning with Matrix-based Genetic Algorithm
Ming-Yu Li, Pei-Fa Sun, Sang-Woon Jeon and Hu Jin (Hanyang University, Korea (South)); Xiao-yan Zhao (Henan Normal University, China)

Session E7-5 Differential Evolution Enhanced by Combining Group Learning and Elite Learning
Guang-Xu Shen, Jian-Yu Li, Pei-Fa Sun, Sang-Woon Jeon and Hu Jin (Hanyang University, Korea (South))

[Session F7] ICTC Workshop on Military Informatics (IWMI) 1

Oct. 13, 08:30~10:00

Chair : Prof. Soo Young Shin (Kumoh Nat'l Institute of Technology, Korea)

Session F7-1 Simple energy saving scheme for ad-hoc network based on MIL-STD-188-220
Hyungkook Oh (Hanyang University, Korea (South))

Session F7-2 Unravelling the Black Box: Enhancing Virtual Reality Network Security with Interpretable Deep Learning-Based Intrusion Detection System
Urslla Uchechi Izuazu, Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))

Session F7-3 Federated Learning with Differential Privacy for Intrusion Detection in Internet of Flying Things: A Robust Approach
Vivian Ukamaka Ihekoronye, Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))

Session F7-4 Structural Anomaly Detection in Advanced Manufacturing Execution Systems
Md Raihan Subhan, Md Javed Ahmed Shanto, Love Allen Ahakonye, Dong Seong Kim and Taesoo Jun (Kumoh National Institute of Technology, Korea (South))

Session F7-5 Enhanced Healthcare System with NFT-Prescription
Gifar Arif Haryadi, Allwinnaldo Allwinnaldo, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

Session F7-6 Explainable Adversarial Mitigation Framework for Zero-Trust Cyber Warfare
Ebuka Chinaechetam Nkoro, Cosmas Ifeanyi Nwakanma, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

Session F7-7 Deep Skin Cancer Lesions Classification Scheme
Gabriel Chukwunonso Amaizu, Love Allen Chijioke Ahakonye, Dong-Seong Kim, and Jae-Min Lee (Kumoh National Institute of Technology, Korea (South))

Technical Paper Sessions

[Session P7] Poster Session 6

Oct. 13, 08:30~10:00

Chair : Prof. Hyosu Kim (Chung-Ang University, Korea)

Session P7-1 SpatioTemporal Transformer-based Regressive Domain Adaptation for Remaining Useful Life Prediction
HyunYong Lee, Nacwoo Kim, Jungi Lee and Seok-Kap Ko (ETRI, Korea (South))

Session P7-2 A Convolutional Transformer-based Model for Estimation of Soiling-driven PV Power Loss
HyunYong Lee (ETRI, Korea (South)); Yumin Hwang (Electronics and Telecommunications Research Institute, Korea (South)); Seok-Kap Ko (ETRI, Korea (South))

Session P7-3 Development and verification of usage prediction service for intelligent smart water service
Youngjun Choi (AIBlab, Korea (South)); SungSik Park (AIBLab, Korea (South)); Jun Wook Lee (AIBlab, Korea (South))

Session P7-4 Development of real-time freezing burst diagnosis service using smart water meter reading data
SungSik Park,oungjun Choi, Jun Wook Lee and Yongwoo Kim (AIBlab, Korea (South))

Session P7-5 The effect of noise injection method on DRL-based controller robustness of human gait model
Young-Jun Koo (Electronics and Telecommunications Research Institute, Korea (South)); Jeong-Woo Lee, Bumho Kim and YungJoon Jung (ETRI, Korea (South))

Session P7-6 An Analysis of the Impact of Dataset Characteristics on Data-Driven Reinforcement Learning for a Robotic Long-Horizon Task
Ingook Jang (Electronics and Telecommunications Research Institute, Korea (South)); Samyeul Noh (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Seonghyun Kim and Donghun Lee (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-7 Knowledge-Based Reinforcement Learning for Industrial Robotic Assembly
In Jun Park (Electronics and Telecommunications Research Institute, Korea (South)); Hyonyoung Han, Joonmyun Cho and Jun Hee Park (ETRI, Korea (South))

Session P7-8 Bibliometric study on artificial intelligence technologies for semiconductor defects
Seongeun Kim (Samsung Electronics, Korea (South)); Eunil Park (Sungkyunkwan University, Korea (South))

Session P7-9 Image Annotation Using VQGAN and Backtranslation
Dong-Hyuck Im and Yongseok Seo (ETRI, Korea (South))

Session P7-10 An Empirical Investigation of Visual Reinforcement Learning for 3D Continuous Control
Samyeul Noh (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Seonghyun Kim, Ingook Jang and Donghun Lee (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-11 PINN application for compressible gas flow transient analysis
Sangjoon Lee, Byung Tak Lee and Seok-Kap Ko (ETRI, Korea (South))

Session P7-12 Digital Phenotype Collection System Utilizing Smart Devices
Jeong Mook Lim and Seungeun Chung (Electronics and Telecommunications Research Institute, Korea (South)); Se Won Oh and Kyoung-Ju Noh (ETRI, Korea (South)); Hyuntae Jeong (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-13 Brush Up with AR: Supporting Children's Enjoyable Tooth-brushing through Augmented Reality Feedback
Yuju Kang, Nari Kim, Ellie Lee, Gyeyoung Jung, Jaeyong Lee, SeungKyun Han and Jaejeung Kim (Chungnam National University, Korea (South))

Technical Paper Sessions

Session P7-14 Elastic Deformable Augmentation for Autonomous Driving
Jungwook Shin, Jaeill Kim and Wonjong Rhee (Seoul National University, Korea (South))

Session P7-15 LPI radar signal recognition with U²-Net-based denoising
Siho Lee and Haewoon Nam (Hanyang University, Korea (South))

Session P7-16 Usefulness of using Nvidia IsaacSim and IsaacGym for AI robot manipulation training
Hyonyoung Han, Joonmyun Cho and Young-Sung Son (ETRI, Korea (South))

Session P7-17 A lightweight deep-learning radar gesture recognition based on a structured pruning-NAS
Eungang Son, Seungeon Song and Jonghun Lee (DGIST, Korea (South))

Session P7-18 Dual Adaptive Data Augmentation for 3D Object Detection
Joohyun Lee and Jinhee Lee (DGIST, Korea (South)); Jae-Keun Lee (FutureDrive, Korea (South)); Jeseok Kim (DGIST, Korea (South)); Soon Kwon (DGIST & FutureDrive Inc., Korea (South)); Sang-Dong Kim (Daegu Geongbuk Institute of Science and Technology, Korea (South))

Session P7-19 Clustering Mobile Traffic Data with Autoencoder Using Time-Series Encoded as Images
Sang-Yeon Lee (Kyunghee University, Korea(South)); Hyeon-Min Yoo, Jong-Seok Rhee, Geon Kim and Een-Kee Hong (Kyunghee University, Korea (South)); Byungsuk Kim and Kyeongjun Shin (Korea Telecom (KT), Korea (South))

Session P7-20 Development of AutoML based multifunctional complex dyeing sensor for energy saving
Jeong In Lee, Jinsoo Han and Wan-Ki Park (ETRI, Korea (South))

Session P7-21 Multi-View Stereo Using Discontinuity-Aware Planar Parameters
Hanshin Lim and Hyon-Gon Choo (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-22 An Interactive System for Painterly Image Harmonization
Juwon Lee, Jung-Jae Yu and Wonyoung Yoo (ETRI, Korea (South))

Session P7-23 Yield Monitoring Service with Time Series Representation of Growth from Crop Images
Seungtaek Oh and Jaewon Moon (Korea Electronics Technology Institute, Korea (South)); Seung Woo Kum (Korea Elecronics Technology Institute, Korea (South)); Sung Kyeom Kim (Kyungpook National University, Korea (South)); Seungwook Choi (Naretrends Inc., Korea (South)); Hyun Kwon Suh (Sejong University, Korea (South)); Soonho Lee (Daliworks Inc., Korea (South))

Session P7-24 A Study on Imputation-based Online Learning in Varying Feature Spaces
Junghoon Lee, Cheol Ho Kim, Sung Yup Lee and Ock Kee Baek (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-25 Agile^{AFP}: ML-enabled Agile Private/Public 5G/B5G Service and Network Autonomic Federation Platform
Taesang Choi (Electronic and Telecommunications Research Institute, Korea (South)); Jeongyun Kim and Sangsik Yoon (ETRI, Korea (South)); Moonkook Park (Mobigen, Korea (South)); SeungKyu Go (& IN-Soft, Korea (South)); Ranganai Chaparadza (IPv6 Forum, Germany)

Session P7-26 Comparison of KoBERT and BERT for Emotion Classification of Healthcare Text Data
Mose Gu and Jaehoon Jeong (Sungkyunkwan University, Korea (South))

Session P7-27 Design and Implementation of Data-Intensive Application using Memory Expansion Device
HooYoung Ahn (ETRI & Electronics and Telecommunications Research Institute, Korea (South)); SeonYoung Kim (Electronics and Telecommunications Research Institute, Korea (South)); Yoo-mi Park and Woo-Jong Han (ETRI, Korea (South))

Session P7-28 A device driver for the AB21 SoC in Supreme-K system
Young-Ho Kim (ETRI, Korea (South)); Eun-Ji Lim (Electronics and Telecommunications Research Institute, Korea (South)); Shinyoung Ahn (Electronics Telecommunication Research Institute, Korea (South)); Yoo-mi Park (ETRI, Korea (South))

Technical Paper Sessions

Session P7-29 Federated Learning in Prediction of Dementia Stage: An Experimental Study
Boyun Eom (ETRI, Korea (South)); Muhammad Zubair (Korea University of Science and Technology & Electronics and Telecommunication Research Institute, Korea (South)); Dong-Hwan Park (Electronics and Telecommunications Research Institute, Korea (South)); Hyunhak Kim, Young-Ho Suh and Sunhwan Lim (ETRI, Korea (South)); Chan-Won Park (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-30 Multi-robot Benchmark for Collaborative Manipulation Tasks
Seonghyun Kim and Ingook Jang (Electronics and Telecommunications Research Institute, Korea (South)); Samyeul Noh (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Donghun Lee (Electronics and Telecommunications Research Institute, Korea (South)); Heechul Bae (ETRI, Korea (South))

Session P7-31 High-level Visual Representation via Perceptual Representation Learning
Donghun Lee (Electronics and Telecommunications Research Institute, Korea (South)); Samyeul Noh (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Ingook Jang and Seonghyun Kim (Electronics and Telecommunications Research Institute, Korea (South)); Heechul Bae (ETRI, Korea (South))

Session P7-32 Design and Implementation of a Cloud-Based Metaverse Virtual Performance Platform
Cho Rong Yu (Electronics and Telecommunications Research Institute, Korea (South)); InMoon Choi and Kyung-Kyu Kang (ETRI, Korea (South)); Youn-Hee Gil (Electronics and Telecommunications Research Institute, Korea (South))

Session P7-33 A Design of Platform for Autonomic Management and Control in 5G
Jeongyun Kim and Taesang Choi (ETRI, Korea (South))

Session P7-34 Optimization of Video Streaming Using SRT Protocol in Mobile Communication Network
Jeong-Hwan Lee and Jihun Cha (ETRI, Korea (South))

[Session A8] Machine Learning 4

Oct. 13, 10:20~11:50

Chair : Dr. Taesang Choi (Electronics and Telecommunications Research Institute, Korea)

Session A8-1 Computer Vision based Smart Bin for Waste Classification
Wongsathorn Wanwong (Burapah University, Thailand); Kornkanok Pobchanad (Burapha University, Thailand); Jakapong Boonyai (Software Developer & VAMStack, Thailand); Sukonthee Sunkhun and Tanin Intaramanee (VAMStack, Thailand); Watcharaphong Yookwan, Krisana Chinnasarn and Athitha On-uean (Burapha University, Thailand)

Session A8-2 AuPPLE: Augmented Physical Priors through Language Enhancement using Self-Supervised Learning
Annie Y Dong (Watchung Hills Regional High School, USA); Anirudh Mazumder (Texas Academy of Mathematics and Science, USA); Mustafa Efe Güzel (TED Sakarya High School, Turkey); Badis Labbedi (United World College Costa Rica, Costa Rica); Zhuo En Chua (SJII, Singapore); Eveer Soriano (Ameritec School, USA); Priyanshu Sethi (The University of Alabama, USA); Michael J Lutz (University of California Berkeley, USA)

Session A8-3 Language-Model-based methods for Vietnamese Single-Document Extractive Summarization
Cuong Vo-Le (Hanoi University of Science and Technology & School of Electronics and Telecommunications, Vietnam); Thinh Xuan Vu (Hanoi University of Science and Technology & AICS Lab, Vietnam); Thien D Vu (Hanoi University of Science and Technology, Vietnam); Hung S Vo (Hanoi University of Science & Technology, Vietnam); Viet Xuan Nguyen (FPT Information System, Vietnam)

Technical Paper Sessions

Session A8-4 Temporal Analysis of World Disaster Risk: A Machine Learning Approach to Cluster Dynamics
Christian Mukendi Mulomba and Hyebong Choi (Handong Global University, Korea (South))

Session A8-5 MetaHate: Text-based Hate Speech Detection for Metaverse Applications using Deep Learning
Judith Nkechinyere Njoku (Kumoh National Institute of Technology, Korea (South)); Anthony Uchenna Eneh (Frontend Engineering Team, Tech and Product Department, Africhange Technologies, Nigeria); Cosmas Ifeanyi Nwakanma, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

[Session B8] Convergence 2

Oct. 13, 10:20~11:50

Chair : Prof. Sang Hyun Lee (Korea University, Korea)

Session B8-1 A*r: a Bounded Suboptimal Search algorithm using Conditional Node Re-expansion Policy
Tien Minh Dam (Viettel High Technology Industries Corporation, Vietnam & Hanoi University of Science and Technology, Vietnam); Dao Tran Le (Viettel High Technology Industries Corporation, Vietnam); Huyen Thi Dinh (Viettel group, Vietnam); Ngan Kim Nguyen (Viettel High Technology Industries Corporation, Vietnam); Tuan Anh Nguyen (Viettel High Technology Industries Corporation, Vietnam & Hanoi University of Science and Technology, Vietnam); Hung Viet Bui (Viettel High Technology Industries Corporation & Insa Toulouse, Vietnam); Tiem Manh Nguyen (Viettel High Technology Industries Corporation, Vietnam); Ha Manh Le (Viettel High Technology Industries Corporation, Vietnam & Moscow Institute of Physics and Technology, Russia)

Session B8-2 Performance Analysis of the V2V System Based on the Nakagami-m Fading Channel
Jiaqing Sun, Chunxiao Li and Chunyan Qi (Yangzhou University, China)

Session B8-3 Auto-Correlation Properties of Binary Sequences Obtained by Switching Two Bernoulli Chaotic Binary Sequences
Akio Tsuneda and Masahiro Fujikawa (Kumamoto University, Japan)

Session B8-4 Performance Analysis of MIMO CR Multihop Relaying with Imperfect CSI in Short-Packet URLLCs
Ngo Hoang Tu (Seoul National University of Science and Technology, Korea (South) & Ho Chi Minh City University of Transport, Vietnam); Dai Hoang (University of Technology Sydney, Australia); Kyungchun Lee (Seoul National University of Science and Technology, Korea (South))

Session B8-5 Throughput Performances of UAV Multi-Hop Communications by Applying Link Adaptation
Ruiyi Zhong and Takatoshi Sugiyama (Kogakuin University, Japan)

Session B8-6 Improvement of a Secret Sharing Scheme to Reduce the Total Data Size
Tatsuki Ishii, Kuniaki Tsuji, Yuya Tarutani, Yukinobu Fukushima and Tokumi Yokohira (Okayama University, Japan)

Technical Paper Sessions

[Session C8] ICTC Workshop on Native AI for B5G and 6G (IWNA)

Oct. 13, 10:20~11:50

Chair : Prof. Seung-Woo Ko (Inha University, Korea)

Session C8-1 Semantic Communication: Communication Needed after AI
Jinho Choi (Deakin University)

Session C8-2 A Survey on Deep Learning-based Resource Allocation Schemes
Donghyeon Kim and Haejoon Jung (Kyung Hee University, Korea (South)); In-Ho Lee (Hankyong National University, Korea (South))

Session C8-3 On the Structured Design for Efficient Machine Learning Based PRACH Preamble Detection
Du Hui Yang, Sang Won Choi(Kyonggi University, Korea(South))

Session C8-4 Efficient Data Communication for Deep Learning Application via Latent Code Transmission in B5G Wireless Networks
Dong Min Kim, Young Hoon Suh and Issamu Fred Ngwalo (Soonchunhyang University, Korea (South))

Session C8-5 Federated Learning with Variational Autoencoder for Popularity Profile Prediction
Minkyun Ahn and Minseok Choi (Kyung Hee University, Korea (South))

Session C8-6 IoT-Aided Spatial Channel Prediction: Ray Analysis Perspective
Jihoon Park (Yonsei University, Korea (South)); Haeun Lee (University of INHA, Korea (South)); Jae-Hong Kim (University of Inha, Korea (South)); Seong-Lyun Kim (Yonsei University, Korea (South)); Seung-Woo Ko (Inha University, Korea (South))

Session C8-7 Mobility-Induced Graph Neural Network for Radio-Based Indoor Positioning
Kyuwon Han (Yonsei University, Korea (South)); Seung Min Yu (Korea Railroad Research Institute, Korea (South)); Seong-Lyun Kim (Yonsei University, Korea (South)); Seung-Woo Ko (Inha University, Korea (South))

[Session D8] ICTC Workshop on 6G Research Initiative (IW6RI)

Oct. 13, 10:20~11:50

Chair : Prof. Kyunghan Lee (Seoul Nat'l University, Korea)

Session D8-1 Deep Reinforcement Learning-Based Sum-rate Maximization in Tethered UAV-Aided IAB Network
Yerin Lee (Hankyong National University, Korea (South)); Heejung Yu (Korea University, Korea (South)); Howon Lee (Hankyong National University, Korea (South))

Session D8-2 Recent Advances and Future Directions for Blockchain-empowered 6G
Sungho Lee (Yonsei University, Korea (South)); Jemin Lee (Yonsei University, Korea (South))

Session D8-3 Survey on Standardization of Integrated Sensing and Communication in 6G and IEEE 802.11bf
Hyeonho Noh and Hyun Jong Yang (POSTECH, Korea (South))

Session D8-4 Max-Min Fairness Precoding for Enhanced Security with Partial Channel Knowledge
Sangmin Lee (Ulsan National Institute of Science and Technology (UNIST), Korea (South)); Eunsung Choi (Ulsan National Institute of Science and Technology, Korea (South)); Jinseok Choi (Korea Advanced Institute of Science and Technology, Korea (South))

Session D8-5 On Designing a Performance-Guaranteed Interface for 6G Cellular Networks
Junseon Kim and Kyunghan Lee (Seoul National University, Korea (South))

Session D8-6 A Survey on AI-Empowered Security Solutions for 6G
Byungha You, Donghyeon Kim and Haejoon Jung (Kyung Hee University, Korea (South))

Technical Paper Sessions

[Session E8] ICTC Workshop on Communication, Sensing, and Perception for Unmanned Vehicles (IWCSUV)

Oct. 13, 10:20~11:50

Chair : Prof. Igbafe Orikumhi (Hanyang University, Korea)

Session E8-1 Deep Neural Network-based Fingerprinting Localization for 5G NR mmWave Small-Cell
Suah Park, Minsoo Jeong, Hyeonjin Chung and Hongseok Jung (Hanyang University, Korea (South)); Hyekyung Jwa and Jeehyeon Na (ETRI, Korea (South)); Sunwoo Kim (Hanyang University, Korea (South))

Session E8-2 Penetration Loss Analysis for mmWave MIMO Communication in Indoor Environments
Hyunsoo Lee, Hanbit Kim, Hyeonjin Chung, Keonho Cha and Sunwoo Kim (Hanyang University, Korea (South))

Session E8-3 Mobility-Aware Resource Allocation in UAV-Assisted ISAC Networks
Igbafe Orikumhi (Hanyang University, Korea (South)); JungSook Bae (ETRI, Korea (South)); Sunwoo Kim (Hanyang University, Korea (South))

Session E8-4 Enhancing Prototypical Space for Interpretable Image Classification
Jae Soon Baik, Kyoung Ok Yang and Jun Won Choi (Hanyang University, Korea (South))

Session E8-5 PIDDNet: RGB-Depth Fusion Network for Real-time Semantic Segmentation
Yunsik Shin, Yongho Son and Jun Won Choi (Hanyang University, Korea (South)); JungHee Park (& LIGNex1, Korea (South)); Chaehyun Lee and YangGon Kim (LIG Nex1 Co. Ltd., Korea (South))

[Session F8] ICTC Workshop on Military Informatics (IWMI) 2

Oct. 13, 10:20~11:50

Chair : Prof. Jae-Min Lee (Kumoh Nat'l Institute of Technology, Korea)

Session F8-1 X-HDNN: Explainable Hybrid DNN for Industrial Internet of Things Backdoor Attack Detection
Love Allen Ahakonye, Cosmas Ifeanyi Nwakanma, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

Session F8-2 Blockchain-aided Decentralized Collaborative Automatic Modulation Classification for Next-Generation Wireless Networks
Ahmad Zainudin (Kumoh National Institute of Technology, Korea (South) & Politeknik Elektronika Negeri Surabaya, Indonesia); Revin Naufal Alief (Kumoh National Institute of Technology, Korea (South)); Made Adi Paramartha Putra (Kumoh National Institute of Technology, Korea (South) & STMIK Primakara, Indonesia); Rubina Akter (Kumoh National Institute of Technology & Networked Systems Laboratory, Korea (South)); Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

Session F8-3 Carbon-Credit Monitoring and Prediction in Smart Factory Using Explainable AI and Data Analytics
Cosmas Ifeanyi Nwakanma (Kumoh National Institute of Technology, Korea (South)); Martin Uwakwe (Western Illinois University, USA); Ikenna Uzoma Ajere (Federal University of Technology Owerri, Nigeria); Ebuka Chinaechetam Nkoro, Love Allen Ahakonye and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

Session F8-4 Blockchain-based Federated Learning for Bearing Fault Detection in the Industrial Internet of Things
Made Adi Paramartha Putra (Kumoh National Institute of Technology, Korea (South) & STMIK Primakara, Indonesia); Ahmad Zainudin (Kumoh National Institute of Technology, Korea (South) & Politeknik Elektronika Negeri Surabaya, Indonesia); Revin Naufal Alief (Kumoh National Institute of Technology, Korea (South)); Gabriel Avelino R Sampedro (University of the

Technical Paper Sessions

Philippines, Philippines & Kumoh National Institute of Technology, Korea (South)); Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))

Session F8-5 Optimizing UAV Navigation through Non-Uniform B-Spline Trajectory for Tracking UAV Enemy
Muhammad Wicaksono and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))

Session F8-6 Predicting Bike-Sharing Demand: A Machine Learning Approach for Urban Mobility Analysis
Md Javed Ahmed Shanto (Kumoh National Institute of Technology, Korea (South)); Rubina Akter (Kumoh National Institute of Technology & Networked Systems Laboratory, Korea (South)); Dong Seong Kim and Taesoo Jun (Kumoh National Institute of Technology, Korea (South))

Session F8-7 A Novel Deep Learning-Assisted Truck Driver Drowsiness Record using Blockchain Technology
Odinachi Udemezuo Nwankwo, Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))

[Session P8] Poster Session 7

Oct. 13, 10:20~11:50

Chair : Dr. Seung-Que LEE (Electronics and Telecommunications Research Institute, Korea)

Session P8-1 Design and Implementation of O-RAN M-Plane System
Seung-Que Lee and JunHwan Lee (ETRI, Korea (South)); Moon-Sik Lee (Electronics and Telecommunications Research Institute, Korea (South)); Hwansouk Yoo (RACHTEC, Korea (South))

Session P8-2 Phase Drift Compensation of Sub-THz Horn Antenna Pattern in Presence of Phase Center Offset and Orientation Misalignment
Kyung-Won Kim (ETRI, Korea (South)); Jung-Nam Lee (Electronics and Telecommunications Research Institute, Korea (South)); Myung-Don Kim (ETRI, Korea (South))

Session P8-3 An Implementation of Assistant Sevice for Phone Call Receiver
Sungwon Byon (Electronics and Telecommunication Research Insititute, Korea (South)); Eunjung Kwon, Hyunho Park and Eui-Suk Jung (ETRI, Korea (South))

Session P8-4 Implementation of Single Chip 28 GHz SPDT Switch-less Front-end Circuits in a 65nm CMOS process
Seunghyun Jang (ETRI, Korea (South)); Sunwoo Kong (Electronics and Telecommunications Research Institute, Korea (South)); Hui Dong Lee (Electonics and Telecommunications Research Institute, Korea (South)); Bonghyuk Park and Kwang-Seon Kim (ETRI, Korea (South)); Jung Hwan Hwang (Electronics and Telecommunications Research Institute, Korea (South))

Session P8-5 A Design of TRX dual mode Baseband Analog with Dynamic Range and DC offset controller for applying NB-IoT
Han-Min Song (University of Sungkyunkwan & Skaichips, Korea (South)); Ji Hoon Song, Dong-Gyu Kim, YoungGun Pu and Kang-Yoon Lee (Sungkyunkwan University, Korea (South))

Session P8-6 Wireless Embedded Index Coded Transmissions with Multiple Antennas
Heekang Song (KAIST, Korea (South)); Kyungrak Son and Wan Choi (Seoul National University, Korea (South))

Session P8-7 Vehicle Re-identification with Spatio-temporal Information
Hye-Geun Kim, YouKyoung Na and Hae-Won Joe (Chonnam National University, Korea (South)); Yong-Hyuk Moon (Electronics and Telecommunications Research Institute (ETRI) & University of Science and Technology (UST), Korea (South)); Yeong-Jun Cho (Chonnam National University, Korea (South))

Technical Paper Sessions

Session P8-8 A Deep Learning Approach Based on Image Patch Sets for Art Forgery Detection
Soonchul Jung (ETRI, Korea (South)); Jae Woo Kim and Jin-Seo Kim (Electronics and Telecommunications Research Institute, Korea (South)); Yoon-Seok Choi (ETRI, Korea (South))

Session P8-9 Development of a Hand Motion Tracking based Teleoperation System for Imitation learning
Jinchul Choi (Electronics and Telecommunications Research Institute, Korea (South)); Heechul Bae (ETRI, Korea (South)); Chan-Won Park (Electronics and Telecommunications Research Institute, Korea (South))

Session P8-10 3D Object Classification and Segmentation from Large-Scale Area Reconstruction
Hye-Sun Kim, Yun ji Ban and Chang Joon Park (ETRI, Korea (South)); Howon Kim (Electronics and Telecommunications Research Institute, Korea (South))

Session P8-11 Gesture Classification Based on System's Emotion and Strategy for Korean Dialogue Systems
Yeongbeom Lim (KETI, Korea (South)); Jin Yea Jang and San Kim (Korea Electronics Technology Institute, Korea (South)); Saim Shin (KETI, Korea (South)); Minyoung Jung (Korea Electronics Technology Institute, Korea (South))

Session P8-12 Multi-modal Emotion Recognition Utilizing Korean-English Vision and Language Information Alignment Pre-trained Model
Jeeyoung Yun, San Kim and Minyoung Jung (Korea Electronics Technology Institute, Korea (South)); Saim Shin (KETI, Korea (South)); Jin Yea Jang (Korea Electronics Technology Institute, Korea (South))

Session P8-13 RGOR: De-noising of LiDAR point clouds with reflectance restoration in adverse weather
Seung-Jun Han and Dongjin Lee (Electronics and Telecommunications Research Institute, Korea (South)); Kyoung-Wook Min (ETRI & Chungnam National University, Korea (South)); Jeong-Dan Choi (Electronics and Telecommunications Research Institute, Korea (South))

Session P8-14 Preliminary study for Conversational Korean-Vietnam Neural Machine Translation
Seonhui Kim, Seung Yun and Sang-Hun Kim (ETRI, Korea (South))

Session P8-15 A Study on Few-shot Object Detection for Warships Based on Data Generation Using Image Outpainting
SungWon Moon, Jiwon Lee, Jungsoo Lee, Dowon Nam and Wonyoung Yoo (ETRI, Korea (South))

Session P8-16 Lower body action classification using unlabeled predicted motion
Ho Chul Shin, Dong-Woo Lee, Son Yong Ki and Hur Ki Soo (ETRI, Korea (South))

Session P8-17 Stacking Ensembles-based Approach for Pattern Diagnosis of Tabular Data
Jun Koo Lee (University of Sungkynkwan, Korea (South)); TaiMyoung Chung (SungkyunKwang University, Korea (South))

Session P8-18 Automatic Highlight Generation of Soccer Videos
Jiwoo Park (POSTECH, Korea (South)); Younkyung Jwa (Gwangju Institute of Science and Technology, Korea (South)); Jiin Kwak (Ulsan National Institute of Science and Technology, Korea (South)); Jihun Lim (Korea University, Korea (South)); Sehee Kim (Seoul National University, Korea (South))

Session P8-19 Complex Motion-aware Splatting for Video Frame Interpolation
Minho Park (Electronics and Telecommunications Research Institute, Korea (South)); Yuseok Bae (ETRI, Korea (South))

Session P8-20 Few images based 3D Reconstruction of Korean Wooden Architecture Bracketing System(Gongfo)
Jong Gook Ko and Seung Jae Lee (ETRI, Korea (South))

Technical Paper Sessions

Session P8-21 Code Repository Vulnerability Focusing on RepoJacking
Minjae Kim and Shinho Lee (ESTsecurity, Korea (South)); TaeHyeong Kwon (ESTSecurity, Korea (South)); Wookhyun Jung and Eui Tak Kim (ESTsecurity, Korea (South))

Session P8-22 A Viewport Adaptive Low-latency Streaming System for Large-scale Multi-view Service
Jewon Lee and Eun Hee Hyun (ETRI, Korea (South)); Soon-Choul Kim (Electronics and Telecommunications Research Institute, Korea (South)); Joon-Young Jung (ETRI, Korea (South))

Session P8-23 A Study on Military Object Detection in Panoramic View Using Stable Diffusion
Jiwon Lee (Electronics and Telecommunications Research Institute, Korea (South)); SungWon Moon and Do-Won Nam (ETRI, Korea (South))

Session P8-24 CongNaMul: A Dataset for Advanced Image Processing of Soybean Sprouts
Byunghyun Ban, Donghun Ryu and Su-won Hwang (Imagination Garden Inc., Korea (South))

Session P8-25 Improved Classification Algorithm for Restricted Coulomb Energy-based Neural Network
Kyou Jung Son (Korea Electronics Technology Institute, Korea (South)); Seokhun Jeon (KETI, Korea (South)); Jeahack Lee and Byung-Soo Kim (Korea Electronics Technology Institute, Korea (South))

Session P8-26 Comparative Analysis of WAVE and 5G Mobile Communication Performance for Advanced V2X Communication
Taeuk Park (Gumi Electronics and Information Technology Research Institute, Korea (South)); Mahn-suk Yoon (Gumi Electronics & Information Technology Research Institute, Korea (South)); Hyunjoo Lee (Gumi Electronics and Information Technology Research Institute, Korea (South))

Session P8-27 An Improvement of A Lightweight NFC Authentication Algorithm Based on Modified Hash Function
Min-Shiang Hwang and Hou-Wen Li (Asia University, Taiwan); Cheng-Ying Yang (University of Taipei, Taiwan)

Session P8-28 Performance Analysis of Space-Time Line Code Systems with Phase-Shift Keying Modulation
Chan Hyung Kim, Yojin Lim and Seung-Chan Lim (Hankyong National University, Korea (South)); Jingon Joung (Chung-Ang University, Korea (South))

Registration

- Author Registration Deadline : September 6, 2023
- Early Registration Deadline (Non-Author) : October 1, 2023
- Late Registration : October 2 ~ October 13, 2023

Registration Policy

1. To be published in the ICTC 2023 Conference Proceedings, a minimum of one author from each accepted paper MUST register at the registration fee (member or non-member) and the paper must be presented at the conference.
2. "Member" rates apply to members of IEEE (Institute of Electrical and Electronics Engineers), IEICE (The Institute of Electronics, Information and Communication Engineers), KICS (Korea Institute of Communications and Information Science), and CIC (China Institute of Communications).
3. A valid student ID is required at the registration desk to check the eligibility for student-rate registration.
4. Author/ Non-Author registration cannot be refunded after early registration.
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	Late	$500 / $550	₩500,000 / ₩550,000

* Student : Student registration fee does not apply to the author registration.

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Venue

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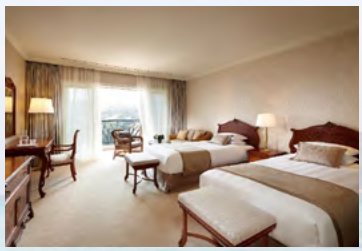
Located in the Jungmun Tourist Complex on the magnificent island of Jeju, LOTTE HOTEL JEJU is one of the finest resort hotels in Korea offering 500 rooms.
Modeled after the South African resort hotel, "The Palace of the Lost City," LOTTE HOTEL JEJU boasts an exotic atmosphere in harmony with its natural surroundings.
In addition to four restaurants and lounges and six event spaces optimized for large-scale international events and seminars, it features various facilities beloved by families and couples alike, including the all-season outdoor spa pool, Hello Kitty character room, PlayTopia, and more.



Travel Information

Hallasan National Park

Hallasan stands out at the center of South Korea's southernmost island, boasting exquisite landscapes due to its varied volcanic topography and vegetation distribution ranging vertically through the subtropical, temperate, frigid and alpine zones. The special nature of this area led to its being designated and managed as a national park in 1970, a UNESCO Biosphere Reserve in 2002, a World Natural Heritage Site in 2007. Muljangori Oreum registered as a Ramsar Wetland in 2008.

Jeju Olle

"Olle" [Ole] is the Jeju word for a narrow pathway that is connected from the street to the front gate of a house. Hence, "Olle" is a path that comes out from a secret room to an open space and a gateway to the world. If the road is connected, it is linked to the whole island and the rest of the world as well. It has the same sound as "Would you come?" in Korean, so Jeju's "Olle" sounds the same as 'Would you come to Jeju?'. The first trail route was opened to the public in September, 2007. Since then, the Jeju Olle exploration team has created a combined total of 200km of walking trails in Jeju island. Currently eleven trail routes have been opened to walkers and the trail exploration team is still working on new routes.

Udo (Cow Islet)

The island was named "Udo" or "Cow Island" as its contours look like a cow lying down on the ground. There are 8 scenic wonders of Udo: day and night(Judan-myeongwol and Yahang-eobeom), sky and earth (Cheonjin-gwansan and Jidu-cheongsa), front and back (Jeonpo-mangdo and Huhae-seokbyeok), and east and west (Dongan-gyeonggul and Seobin-baeksa). The movie "In October" and "The mermaid" were shot at Cow Island, capitalizing on its picturesque scene of a fishing village and a lush, peaceful grassy field. The white sand beach facing the indigo and turquoise sea of Jeju is very impressive.

Seongsan Ilchulbong (Sunrise Peak)

99 rocky peaks surround the crater like a fortress and the gentle southern slope connected to water is a lush grassland. On the grassland at the entrance of Sunrise Peak, you can enjoy horseback riding. Breathtaking scenic views while taking a rest in the middle of climbing up the peak such as Mount Halla, the deep blues of the ocean, the multi-colored coast line, and the picturesque neighboring villages will become unforgettable memories.

Seopjikoji

Jutting out at the eastern seashore of Jeju Island, Seopji-Koji is one of the most scenic views with the bright yellow canola and Seongsan Sunrise Peak as a backdrop. The pristine beauty of Jeju can be seen in Seopji-koji. Sinyang Beach, a meadow filled with canola flowers, peacefully grazing Jeju ponies, a rocky sea cliff, and a towering legendary large rock (Sunbawe) all combine to make nature s masterpiece. Unlike the other coastal areas of Jeju, it has red volcanic rock (songi) and strangely-shaped rocks that at low tide transform this area into a breath-taking stone exhibition gallery.

Travel Information

Manjang Cave

Manjang Cave, situated at Donggimnyeong-ri, Gujwa-eup, North Jeju, 30 kilometers east of Jeju City, was designated as Natural Monument No. 98 on March 28, 1970. The 7,416-meter long cave has been officially recognized as the longest lava tube in the world. The annual temperature inside the cave ranges from 11℃ to 21℃, thus facilitating a favorable environment throughout the year. The cave is also academically significant as rare species live in the cave. Created by spewing lava, "the lava turtle", "lava pillar", and "Wing-shaped Wall" look like the work of the gods. It is considered to be a world class tourist attraction.

Gimnyeong Maze Park

This park was opened to the public in 1997 after its development was begun in 1987. In the area of about 3300 square meters, there are 1232 Leylandii trees and two Gold Leylandii trees from England. The overall extended length of labyrinth is 932 m and the shortest course between entrance and exit is 190 m long. Manjang Cave Culture Center, located between Manjang Cave and Gimnyeoungsa Cave, is a part of Manjang Cave tourist complex which is currently being expanded. Three bridges totaling 46 m and an observatory give visitors ample opportunities for picture taking.

Geomun Oreum

The eroded valley of lava that erupted from the middle of the crater is the largest on Jeju Island. On one side is a 4km oval valley. On the southeast ranch site, there are many conical hills with lava detritus which are volcanic cones without craters. The Geomi Oreum in Songdang-ri, Gujwa-eup is also called the East Geomun Oreum to distinguish it from this West Geomun Oreum. Local residents call it Geomul Chang (Geomeol Chang) or the Geomun Oreum since it looks black when covered with forest. However, according to a scholars etymological study, "Geomun" originates from "Gam or Geom" during the Ancient Joseon Era which means "God". Therefore, "Geomun Oreum" means "Holy mountain". The forest is thick with Pinus thunbergii and Japanese cedars. It is a multiple-shaped volcanic cone. On the top of the mountain, there is a large crater with a small peak with a horse hoof-shaped crater that widens to the northeast.

Mysterious Road (Dokkaebi Road)

On Mysterious Road (or Bugaboo Road), a parked car on a slight hill road rolls uphill instead of going downhill. This is a result of an optical illusion in which the lower part looks higher because of its surrounding environment.

Cheonjiyeon Waterfall

The waterfall falls from a precipice with thundering sounds, creating white water pillars. It has the name Cheonjiyon, meaning 'the heaven and the earth meet and create a pond'. At 22 m in height and 12 min width, the waterfall tumbles down to the pond to produce awe-inspiring scenery. The valley near the waterfall is home to Elaeocarpus sylvestrisvar, ellipticus, which is Natural Monument No. 163, Psilotum nudum, Castanopsis cuspidatavar.sieboldii, Xylosma congestum, Camellia and other subtropical trees. This place is also famous as home to the eel of Anguilla mauritiana, which is Natural Monument No. 27 and is active primarily at night.

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Memo

Memo


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LG U+

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Metaverse (UVERSE)

Amidst the global pandemic, a new world has emerged: the metaverse. LG U+ leads the way with ‘UVERSE' - a secure, convenient, and sustainable metaverse campus that redefines the future of education.

Key Accomplishments

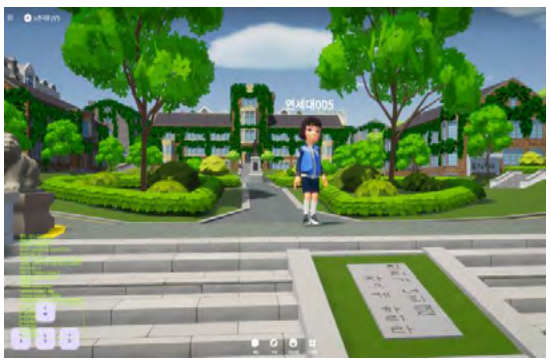
Advanced development metaverse campus environment

- ✓ Launch on exclusive university metaverse platform 'UVERSE' (U-verse) (4.2023)
- ✓ Provided web-based metaverse for PC & mobile without app download
- ✓ Implementation of university-standard maps with 3D modeling, offered through monthly subscription
- ✓ 8 specialized university features, including libraries, promotion halls, admissions, and job fairs.

<www.uverse.co.kr>

<University Standard Map>

References



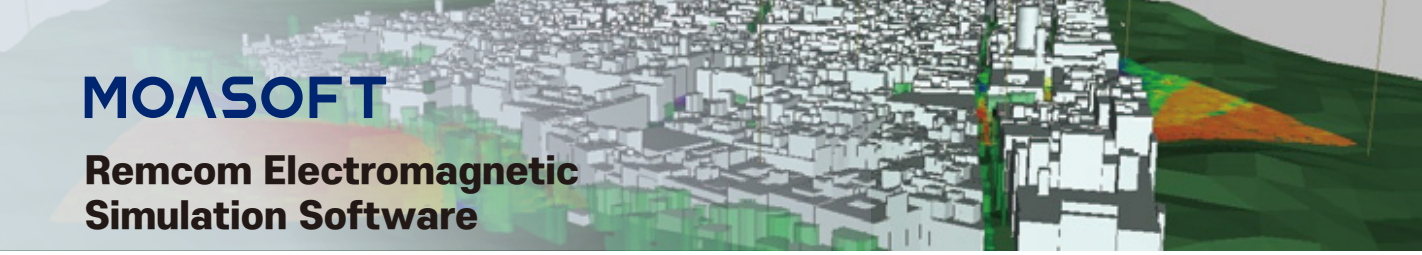
<Yonsei Virtual Campus>

- ✓ Opening of exclusive university metaverse for Yonsei University and Hankuk University of Foreign Studies
- ✓ Opening of ‘Snowverse’, a dedicated metaverse for Sookmyung Women’s University.
- ✓ Opening of ‘Meta-Life’ (Meta-Life, CJU), a dedicated metaverse for Cheongju University.
- ✓ Opening of dedicated metaverse for Soonchunhyang University.

Next Step

Execute campus expansion and activation projects to facilitate the digital transformation of the university

- ✓ Create Open platform to integrate academic and UGUC production
- ✓ Learning Management System(LMS) integration with each university
- ✓ Social, community, special, and item decoration studios, etc.



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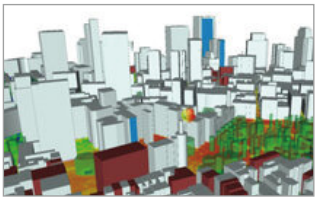
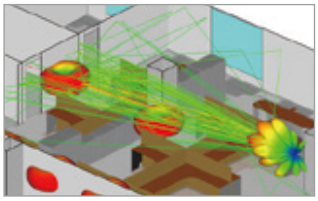
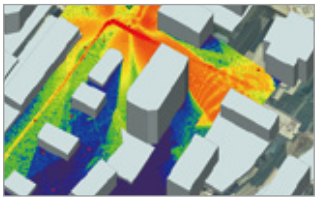
Remcom Electromagnetic Simulation Software

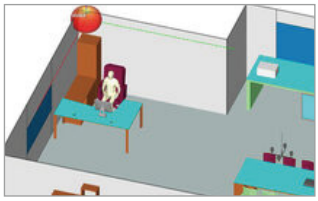
3D Wireless Prediction Software

Wireless InSite는 무선 통신 시스템, 무선 네트워크, 센서, 레이더 및 전파를 송신하거나 수신하는 기타 장치를 분석하기 위한 사이트별 전파 환경 시뮬레이션 소프트웨어입니다.


Outdoor mmWave Planning

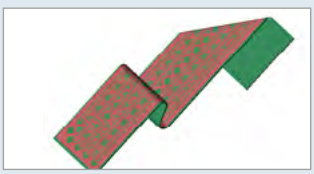

Indoor mmWave Analysis

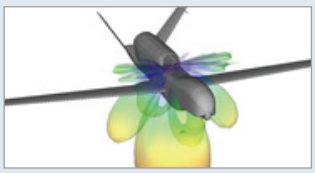

Beamforming Simulations

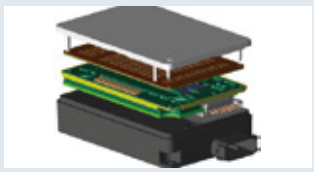

MIMO and Array Design for 5G

XFdtd 3D Electromagnetic Simulation Software

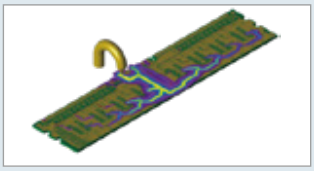
XFdtd는 복잡한 고정밀 RF 장치에서 EM 모델링 및 전파 특성을 분석하기 위한 3D 전자기 시뮬레이션 소프트웨어입니다.

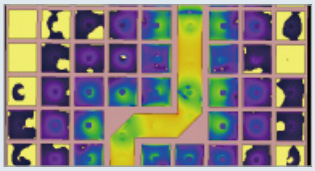

Antenna Design

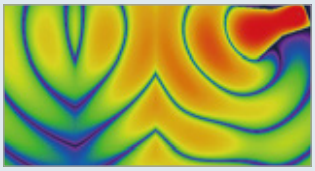

Antenna Placement


Automotive Radar


Biomedical


ESD Testing


Microwave Devices


Metamaterials


Mobile Device

WaveFarer® Automotive Radar Simulation Software

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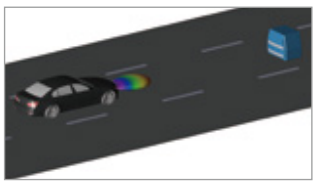
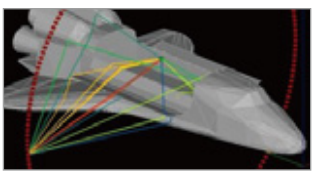
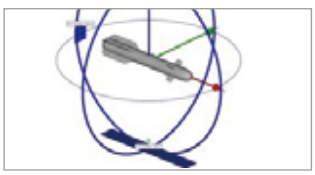
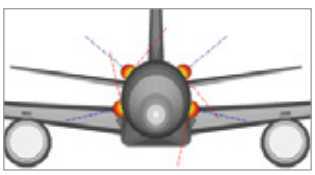

Automotive Radar

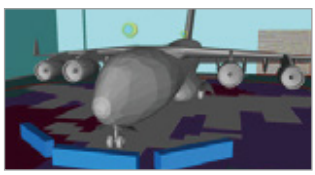
XGtd

XGtd는 대형 구조체에 대해 RCS 해석, 탑재 안테나의 방사 특성 및 co-site 특성 등을 분석하기 위한 광선추적 알고리즘 기반 전자기 시뮬레이션 소프트웨어입니다.


Radiation from Platform-Mounted Antennas


Radar Cross Section (RCS)


Co-Site Analysis


Anechoic Chamber Simulation

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