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- Husneni Mukhtar, Telkom University, Indonesia
- Hidekazu Murata, Yamaguchi University, Japan
- Woongsoo Na, Kongju National University, South Korea
- Ayano Naito, Aichi Institute of Technology, Japan
- Jin Nakazato, Tokyo University of Science, Japan
- Dukyun Nam, Kyungpook National University, South Korea
- Seung Yeob Nam, Yeungnam University, South Korea
- Shusuke Narieda, Kyushu Institute of Technology, Japan
- Harish Narne, Dazzlon Computer Services Inc, USA
- N Nasimuddin, Institute for Infocomm Research, Singapore
- Amiya Nayak, University of Ottawa, Canada
- Anand Nayyar, Duy Tan University, Vietnam
- Vibha Negi, Microsoft, USA
- Najett Neji, Paris-Saclay University, France
- Nhan Nguyen, University of Oulu, Finland
- Tri-Hai Nguyen, Van Lang University, Vietnam
- Truong Khang Nguyen, Van Lang University, Vietnam
- Devarani Devi Ningombam, National Institute of Technology (NIT), Patna, India
- Song Noh, Incheon National University, South Korea
- Wonjong Noh, Hallym University, South Korea
- Toshiro Nunome, Nagoya Institute of Technology, Japan
- Hiroshi Oguma, National Institute of Technology, Toyama College, Japan
- Seungmin Oh, Kongju National University, South Korea
- Yuichi Ohsita, The University of Osaka, Japan
- Mai Ohta, Kogakuin University, Japan
- Yasuo Okabe, Kyoto University, Japan
- Hiraku Okada, Meijo University, Japan
- Kenko Ota, Nippon Institute of Technology, Japan
- Sangheon Pack, Korea University, South Korea
- Jeongyeup Paek, Chung-Ang University, South Korea
- Deven Panchal, AT&T, USA
- Daejin Park, Kyungpook National University (KNU), South Korea
- Daeyoung Park, Inha University, South Korea
- Hosung Park, Chonnam National University, South Korea
- Hyungbae Park, University of North Georgia, USA
- Hyunggon Park, Ewha Womans University, South Korea
- Hyunhee Park, Myongji University, South Korea
- Jaehyun Park, Pukyong National University, South Korea
- Jihong Park, Singapore University of Technology and Design, Singapore
- JoonGoo Park, Kyungpook National University, South Korea

- Ki-Hong Park, King Abdullah University of Science and Technology (KAUST), Saudi Arabia
- Laihyuk Park, Seoul National University of Science and Technology, South Korea
- Minh Park, Soongsil University, South Korea
- Sangoh Park, Chung-Ang University, South Korea
- Sangwoo Park, King's College London, United Kingdom (Great Britain)
- Seok-Hwan Park, Hanyang University ERICA, South Korea
- Seunghyun Park, Hansung University, South Korea
- Soohyun Park, Sookmyung Women's University, South Korea
- Suwon Park, Kwangwoon University, South Korea
- Shuping Peng, Huawei Technologies, China
- Thanh Pham, Shizuoka University, Japan
- Paulo F Pinto, Universidade Nova de Lisboa, Portugal
- Gaurav Pokharkar, Arizona State University, USA
- Tony Q. S. Quek, Singapore University of Technology and Design, Singapore
- Hassaan Khaliq Qureshi, National University of Sciences and Technology, Pakistan
- Ilkyeun Ra, University of Colorado Denver, USA
- Sruthi Rachamalla, Southern Illinois University, Carbondale, USA
- Redha M Radaydeh, Texas A&M University-Commerce, USA
- Shafeeq Ur Rahaman, Monks, USA
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- Luca Reggiani, Politecnico di Milano, Italy
- Eric Renault, LIGM, Université Gustave Eiffel, CNRS, ESIEE Paris, France
- Seung Hyong Rhee, Kwangwoon University, South Korea
- Mohammed Ridouani, Hassan 2 University Casablanca - ESTC, Morocco
- Joel J. P. C. Rodrigues, Senac Fac of Ceará, Brazil
- Nuno Rodrigues, Instituto Politécnico de Bragança, Portugal
- Heejun Roh, Inha University, South Korea
- Harald Rohde, Nokia, Germany
- Roberto Rojas-Cessa, New Jersey Institute of Technology, USA
- Simon Pietro Romano, University of Napoli Federico II, Italy
- Xiaojun Ruan, California State University, East Bay, USA
- Ansa Shermin S, Bits Pilani K K Birla Goa Campus, India
- Yatendra Sahu, IIIT Bhopal, India
- Masato Saito, University of the Ryukyus, Japan
- Chathura Sarathchandra, InterDigital Europe, United Kingdom (Great Britain)
- Nurul I. Sarkar, Auckland University of Technology, New Zealand
- Sohail Sarwar, NAMAL University, Pakistan
- Koya Sato, The University of Electro-Communications, Japan
- Kwang-deok Seo, Yonsei University, South Korea
- Junhee Seok, Korea University, South Korea
- Peer Azmat Shah, Higher Colleges of Technology, United Arab Emirates
- Vrajesh Sharma, Panjab University, Chandigarh, India
- Kuei-Ping Shih, Tamkang University, Taiwan
- Dong-Joon Shin, Hanyang University, South Korea
- Dongwan Shin, New Mexico Tech, USA
- Jitae Shin, Sungkyunkwan University, South Korea
- Oh-Soon Shin, Soongsil University, South Korea
- Seokjoo Shin, Chosun University, South Korea
- Soo Young Shin, Kumoh National Institute of Technology, South Korea
- Wonjae Shin, Korea University, South Korea
- Yoan Shin, Soongsil University, South Korea
- Shigeo Shioda, Chiba University, Japan
- Joni W. Simatupang, Indonesia Defense University, Indonesia
- Paulo Simões, University of Coimbra, Portugal
- Seppo Sirkemaa, , Finland
- Jungmin So, Sogang University, South Korea
- Insoo Sohn, Dongguk University, South Korea
- Ho Kyung Son, ETRI, South Korea
- Yongseok Son, Chung-Ang University, South Korea
- Taewon Song, Dongguk University, South Korea
- Yujae Song, Yeungnam University, South Korea
- Ignacio Soto, Universidad Politécnica de Madrid, Spain
- Arun Kumar SP, Google, Ireland
- Andrej Stefanov, IBU Skopje, Macedonia, the former Yugoslav Republic of
- Wei-Tsung Su, National Ilan University, Taiwan
- Young-Joo Suh, Pohang University of Science and Technology (POSTECH), South Korea
- Himal A Suraweera, University of Peradeniya, Sri Lanka
- Matsuura Takafumi, Nippon Institute of Technology, Japan
- Mikiko Sode Tanaka, Hirotsaki University, Japan
- Akihito Taya, The University of Tokyo, Japan
- Ajay Lotan Thakur, Oracle, USA
- Anurag Thantharate, University of Missouri Kansas City, USA
- Pratik Thantharate, SUNY Binghamton, USA
- Hoang Thi Huong Giang, Tokyo City University, Japan
- Ljiljana Trajković, Simon Fraser University, Canada
- Gia Khanh Tran, Institute of Science Tokyo, Japan
- Kazuya Tsukamoto, Kyushu Institute of Technology, Japan
- Van Dat Tuong, Hanoi University of Science and Technology, Vietnam
- Ihsan Ullah, Yuan Ze University, Taiwan
- Adriaan J. van Wijngaarden, Bell Laboratories, Nokia, USA
- Athanasios V. V. Vasilakos, University of Agder, Norway
- Sivapriya Vellaichamy, Georgia Institute of Technology, USA
- Dario Vieira, EFREI, France
- Carlos Alberto Vieira Campos, Federal University of the State of Rio de Janeiro, Brazil
- Shibiao Wan, University of Nebraska Medical Center, USA
- Lei Wang, Dalian University of Technology, China

- Sheng-Wei Wang, National United University, Taiwan
- You-Chiun Wang, National Sun Yat-Sen University, Taiwan
- Charles H. P. Wen, National Yang Ming Chiao Tung University, Taiwan
- Carlos Becker Westphall, Federal University of Santa Catarina, Brazil
- Michal Wodczak, Samsung Electronics, Poland
- Huai-Kuei Wu, Asia Eastern University of Science and Technology, Taiwan
- Longfei Wu, Fayetteville State University, USA
- Xin-Wen Wu, University of Mary Washington, USA
- Yik-Chung Wu, The University of Hong Kong, Hong Kong
- Qin Xin, University of the Faroe Islands, Faroe Islands
- Li Xu, Fujian Normal University, China
- Sugang Xu, National Institute of Information and Communications Technology, Japan
- Tianhua Xu, University of Warwick, United Kingdom (Great Britain)
- Yao Xu, Georgia Southern University, USA
- Miki Yamamoto, Kansai University, Japan
- Ryo Yamamoto, The University of Electro-Communications, Japan
- Kenichi Yamazaki, Shibaura Institute of Technology, Japan
- Satoshi Yamazaki, Tokai University, Japan
- Guanhua Yan, Binghamton University, USA
- Heecheol Yang, Chungnam National University, South Korea
- Kazuto Yano, ATR, Japan
- Muhammad Azfar Yaqub, Free University of Bolzano, Italy
- Chia-Hung Yeh, National Taiwan Normal University, Taiwan
- Chun-Chao Yeh, National Taiwan Ocean University, Taiwan
- Chai Kiat Yeo, Nanyang Technological University, Singapore
- Younghwan Yoo, Pusan National University, South Korea
- JinYi Yoon, Inha University, South Korea
- Seokhoon Yoon, University of Ulsan, South Korea
- Seunghyun Yoon, Korea Institute of Energy Technology, South Korea
- Joo-Sang Youn, Dongeui University, South Korea
- Meng Yu, Governors State University, USA
- Ji-Hoon Yun, Seoul National University of Science and Technology, South Korea
- Rachid Zagrouba, University of Tunis El Manar, Tunisia
- Sherali Zeadally, University of Kentucky, USA
- Hans-Juergen Zepernick, Blekinge Institute of Technology, Sweden
- Liqiang Zhang, Indiana University South Bend, USA
- Peiyong Zhang, China University of Petroleum (East China), China
- Juzi Zhao, San Jose State University, USA

Message from ICUFN2026 Committees

On behalf of the ICUFN 2026 Committee Chairs, we are delighted to welcome all of you to Milan, Italy, from July 7th to 10th, 2026, for the seventeenth International Conference on Ubiquitous and Future Networks (ICUFN 2026). Since 2009, ICUFN has served as an international forum for sharing advanced research and promoting collaboration in ubiquitous and future communications and networking technologies.

This year, we received 720 paper submissions from around 20 countries worldwide. After a rigorous review process, 285 papers were selected for presentation. The accepted papers have been organized into 21 technical oral sessions, 4 poster sessions, and 17 workshop sessions, covering a wide range of topics such as B5G and 6G communications, AI and its applications, security, military and defense communications, services, applications, and other emerging technologies.

We sincerely appreciate all authors for their valuable contributions. We also thank the Technical Program Committee members, reviewers, workshop organizers, session chairs, keynote and tutorial speakers, and all committee members for their dedicated efforts in preparing a high-quality conference program.

We would also like to express our gratitude to KICS and Politecnico di Milano, as well as our technical co-sponsors, IEEE, IEEE Communications Society, and IEICE Communications Society. Our special thanks go to our patrons and sponsors, including ETRI, Samsung, LG Electronics, KT, LG U+, and other supporting organizations, for their generous support.

We hope all participants will enjoy the technical program of ICUFN 2026, actively exchange ideas with colleagues from around the world, and experience the beauty, history, and culture of Milan.

We look forward to welcoming you to Milan for ICUFN 2026.

Sincerely,



Sungrae Cho
Chung-Ang University, South Korea



Sunwoo Kim
Hanyang University, South Korea



Hamid Reza Karimi
Politecnico di Milano, Italy

ICUFN 2026 Organizing Committee Chairs



Seokjoo Shin
Chosun University,
South Korea



Youn-Hee Han
Korea Univ. of Technology
and Education, South Korea



Hien Quoc Ngo
Queen's University Belfast,
UK



Suguru Kameda
Hiroshima Univ.,
Japan



Mikio Hasegawa
Tokyo University of
Science, Japan

ICUFN 2026 TPC Chairs

ICUFN 2026 Program at a Glance

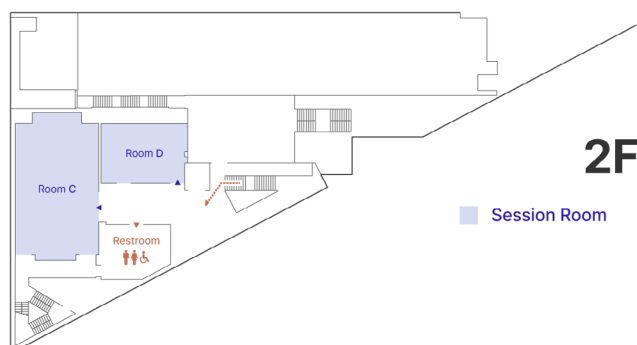
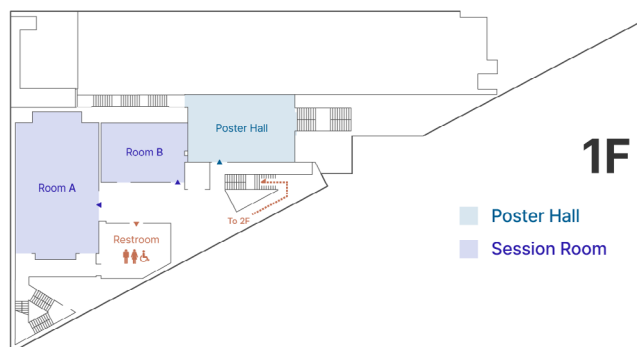
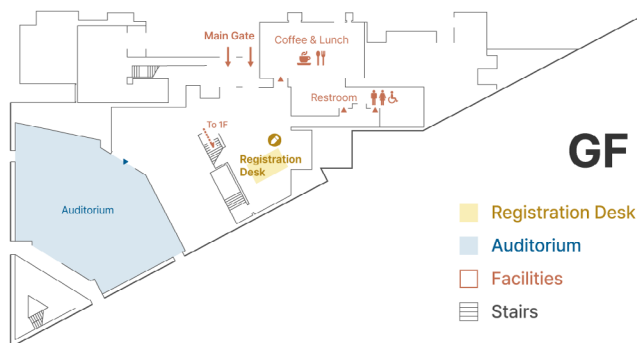
July 06, 2026 (Monday)				
Duration	Room A			
10:00 ~ 12:00	AI-Driven Strategic Planning Workshop for ICUFN (Invitation Only)			
12:00 ~ 14:00	Break			
14:00 ~ 17:00	ICUFN 2026 Committee Meeting (IAC/SC/OC)			

July 07, 2026 (Tuesday)				
Duration	1st Floor		2nd Floor	
	Room A	Room B	Room C	Room D
13:00 ~ 18:00	Registration			
13:00 ~ 14:40	Workshop W1 5G & 6G Communications Networks and Big Data 1 Chair: Prof. Laihyuk Park (Seoul National University of Science and Technology, South Korea)	Workshop W2 International Workshop of AICT (Artificial Intelligence Converged Technology) 1 Chair: Prof. Myoung Jin Lee (Chonnam National University, South Korea)	Workshop W3 International Workshop on Intelligent Vehicles Chair: Prof. Dong Seog Han (Kyungpook National University, South Korea)	Workshop W4 Workshop on Smart System Security Chair: Prof. Junbeom Hur (Korea University, South Korea)
14:40 ~ 15:00	Coffee Break			
15:00 ~ 16:40	Workshop W5 5G & 6G Communications Networks and Big Data 2 Chair: Prof. Woongsoo Na (Kongju National University, South Korea)	Workshop W6 International Workshop of AICT (Artificial Intelligence Converged Technology) 2 Chair: Prof. Myoung Jin Lee (Chonnam National University, South Korea)	Workshop W7 International Workshop on Next Generation OCC and FSO Chair: Prof. Yeong Min Jang (Kookmin University, South Korea)	Workshop W8 Korea-Finland Joint Research Program on Semantic Communication Chair: Prof. Hyowoon Seo (Sungkyunkwan University, South Korea)
16:40 ~ 16:50	Break			
16:50 ~ 18:30	Workshop W9 5G & 6G Communications Networks and Big Data 3 Chair: Prof. Laihyuk Park (Seoul National University of Science and Technology, South Korea)	Workshop W10 International Workshop of AICT (Artificial Intelligence Converged Technology) 3 Chair: Prof. Jeck-Chae Euom (Chonnam National University, South Korea)	Workshop W11 Next-Generation Intelligent Sensing and Communications Chair: Prof. Jingon Joung (Chung-ang University, South Korea)	Workshop W12 Workshop on Smart Radio for IoT Era 1 Chair: Prof. Takeo Fujii (The University of Electro-Communications, Japan)

July 08, 2026 (Wednesday)					
Duration	1st Floor		2nd Floor		1st Floor
	Room A	Room B	Room C	Room D	Poster Hall
09:00 ~ 18:00	Registration				
09:00 ~ 10:40	Workshop W13 5G & 6G Communications Networks and Big Data 4 Chair: Prof. Woongsoo Na (Kongju National University, South Korea)	Workshop W14 Smart Mobility Connectivity Chair: Prof. Ji-Woong Choi (DGIST)	Workshop W15 Workshop on RISE ICT-ABB Chair: Prof. Joon-Goo Park (Kyungpook National University, South Korea)	Workshop W16 Workshop on Smart Radio for IoT Era 2 Chair: Prof. Osamu Takyu (Shinshu University, Japan)	
	Break				
11:00 ~ 12:00	Opening Ceremony (Location: Auditorium, Ground Floor) Opening Address: Prof. Sungrae Cho, Organizing Committee Chair (Chung-Ang University, South Korea) Welcome Address: Prof. Hamid Reza Karimi, Organizing Committee Chair (Politecnico di Milano, Italy) TPC Reports: Prof. Seokjoo Shin, TPC Chair (Chosun University, South Korea) Chair: Prof. Hyowoon Seo (Sungkyunkwan University, South Korea)				
	Keynote Speech I Task Offloading in Mobile Edge Computing for Internet of Things Prof. Ning Zhang (University of Windsor, Canada) Chair: Prof. Sunwoo Kim (Hanyang University, South Korea)				
12:00 ~ 13:30	Break				
13:30 ~ 14:10	Keynote Speech II (Location: Auditorium, Ground Floor) Task-oriented Intelligent Communication for 6G and Beyond Prof. Byonghyo Shim (Seoul National University, South Korea) Chair: Prof. Mikio Hasegawa (Tokyo University of Science, Japan)				
	Tutorial 1 (Location: Auditorium, Ground Floor) ISAC for Physical-Layer Authentication in 6G Networks Prof. Stefano Tomasin (University of Padova, Italy) Chair: Prof. Hyowoon Seo (Sungkyunkwan University, South Korea)		(Location: Room A, 1st Floor) ICT Express Award Ceremony Chair: Prof. Yeong Min Jang (Kookmin University, South Korea)		
15:00 ~ 15:20	Coffee Break				
15:20 ~ 17:00	Workshop W17 The International Workshop on Beyond-5G Networks: AI-Native RAN and Intelligent ISAC Chair: Prof. Sunwoo Kim (Hanyang University, South Korea)	Technical Session 01 Security, Military, and Defense 1 Chair: Prof. Taehoon Kim (Hanbat National University, South Korea)	Technical Session 02 Communications and Networks for B5G and 6G 1 Chair: Dr. Muhammad Azfar Yaqub (Free University of Bozen-Bolzano, Italy)	Technical Session 03 AI and Its Applications 1 Chair: Prof. Suk-seung Hwang (Chosun University, South Korea)	Poster P1 Chair: Prof. Yeon Ho Chung (Pukyong National University, South Korea)
	Conference Banquet (Location: Radisson Blu Hotel, Milan) Banquet Remarks: Prof. Sunwoo Kim, Organizing Committee Chair (Hanyang University, South Korea) and Selma Boumerdassi, TCIIN Chair (Université Paris 8, France) Awards Ceremony: Prof. Youn-Hee Han, TPC Chair (Korea University of Technology and Education, South Korea) Gala Performance (Opera and String Trio) Chair: Prof. Hyowoon Seo (Sungkyunkwan University, South Korea)				

July 09, 2026 (Thursday)					
Duration	1st Floor		2nd Floor		1st Floor
	Room A	Room B	Room C	Room D	Poster Hall
09:00 ~ 18:00	Registration				
09:00 ~ 10:40	Technical Session 04 Security, Military, and Defense 2 Chair: Prof. Insoo Sohn (Dongguk University, South Korea)	Technical Session 05 Communications and Networks for B5G and 6G 2 Chair: Prof. Yonggang Kim (Kongju National University, South Korea)	Technical Session 06 Communications and Networks for B5G and 6G 3 Chair: Prof. Sumin Jeong, (Kumoh National Institute of Technology, South Korea)	Technical Session 07 AI and Its Applications 2 Chair: Prof. Taesoo Jun (Kumoh National Institute of Technology, South Korea)	Poster P2 Chair: Prof. Eunkyung Kim (Hanbat National University, South Korea)
10:40 ~ 10:50	Break				
10:50 ~ 12:30	Technical Session 08 Security, Military, and Defense 3 Chair: Prof. Taesoo Jun (Kumoh National Institute of Technology, South Korea)	Technical Session 09 Communications and Networks for B5G and 6G 4 Chair: Ji-Woong Choi (DGIST, South Korea)	Technical Session 010 Communications and Networks for B5G and 6G 5 Chair: Prof. Insoo Sohn (Dongguk University, South Korea)	Technical Session 011 AI and Its Applications 3 Chair: Prof. Jin-Woo Jung (Dongguk University, South Korea)	Poster P3 Chair: Prof. Eunkyung Kim (Hanbat National University, South Korea)
12:30 ~ 14:00	Break				
14:00 ~ 14:50	Tutorial 2 Edge Network Intelligence for Distributed AI and Service Automation Prof. Guido Maier & Prof. Sebastian Troia (Politecnico di Milano, Italy) Chair: Prof. Hyosu Kim (Chung-Ang University, South Korea) <i>(Location: Auditorium, Ground Floor)</i>				
14:50 ~ 15:20	Coffee Break				
15:20 ~ 17:00	Technical Session 012 Services, Applications, and Emerging Topics 1 Chair: Dr. Esnot Ara Tuli (University of Southern Denmark, Denmark)	Technical Session 013 Communications and Networks for B5G and 6G 6 Chair: Prof. Jing Wang (University of South Florida, USA)	Technical Session 014 Communications and Networks for B5G and 6G 7 Chair: Prof. Osamu Takyu (Shinshu University, Japan)	Technical Session 015 AI and Its Applications 4 Chair: Prof. Dong Seong Kim (Kumoh National Institute of Technology, South Korea)	Poster P4 Chair: Prof. Jung Hoon Lee (Hankuk University of Foreign Studies, South Korea)

July 10, 2026 (Friday)			
Duration	1st Floor		2nd Floor
	Room A	Room B	Room C
09:00 ~ 12:00	Registration		
09:00 ~ 10:40	Technical Session 016 Services, Applications, and Emerging Topics 2 Chair: Prof. Eisuke Kudoh (Tohoku Institute of Technology, Japan)	Technical Session 017 Communications and Networks for B5G and 6G 8 Chair: Prof. Kohei Ohno (Meiji University, Japan)	Technical Session 018 AI and Its Applications 5 Chair: Prof. Su Min Kim (Tech University of Korea, South Korea)
	Break		
10:40 ~ 10:50	Technical Session 019 Services, Applications, and Emerging Topics 3 Chair: Prof. Seokjoo Shin (Chosun University, South Korea)	Technical Session 020 Communications and Networks for B5G and 6G 9 Chair: Prof. Younghoon Park (Sookmyung Women's University, South Korea)	Technical Session 021 Communications and Networks for B5G and 6G 10 Chair: Prof. Seong Ho Chae, (Tech University of Korea, South Korea)
	Break		
12:30 ~ 14:00	ICUFN 2026 Committee Meeting (IAC/SC/OC)		
14:00 ~ 17:00			
July 11, 2026 (Saturday)			
Duration	Room A		
09:30 ~ 12:00	ICUFN Workshop on AI Convergence Technologies (AIConv 2026) (ICUFN 2026 IAC/SC/OC Members Only)		



July 08, 2026 (Wednesday), 11:00 ~ 12:00

Location: Auditorium, Ground Floor

Keynote Speech I: Task Offloading in Mobile Edge Computing for Internet of Things

Speaker: Prof. Ning Zhang, University of Windsor, Canada

Chair: Prof. Sunwoo Kim (Hanyang University, South Korea)

Abstract:

Internet of things (IoT) lays the foundation for various emerging applications. As IoT devices are generally constrained with resources, mobile edge computing is proposed whereby data generated by IoT devices can be offloaded to nearby edge servers, so that their tasks can be served locally in real-time. Due to the dynamic, heterogenous, and time-varying operating environment, it is very challenging to utilize heterogeneous resources in an efficient way to meet the service requirements. In this talk, two research works on offloading will be presented, including i) deep reinforcement learning aided dynamic task offloading for IoT; and ii) multi-agent deep reinforcement learning for offloading in vehicular edge computing. Finally, future research directions are discussed.



Biography

Dr. Ning Zhang is a Full Professor and Canada Research Chair in the Department of Electrical and Computer Engineering at University of Windsor. He received the Ph.D degree in Electrical and Computer Engineering from University of Waterloo, Canada, in Jan. 2015. After that, he was a postdoc research fellow at University of Waterloo and University of Toronto, respectively. His research interests include connected vehicles, mobile edge computing, wireless networking, and security. He is a member of Royal Society of Canada College, a Distinguished Lecturer of IEEE, and a Highly Cited Researcher (Web of Science). He serves as the Chair for IEEE Technical Committee on Cognitive Networks and the Vice Chair for IEEE Technical Committee on Big Data. He was the Editor-in-Chief (EIC) of IEEE ComSoc Technical Committees Newsletter (TCN) and is the Founding EIC of Journal of Pervasive Intelligence and Internet of Things. He also serves/served as an Associate Editor of IEEE Transactions on Mobile Computing, IEEE Communications Surveys and Tutorials, IEEE Internet of Things Journal, and IEEE Transactions on Cognitive Communications and Networking.

July 08, 2026 (Wednesday), 13:30 – 14:10

Location: Auditorium, Ground Floor

Keynote Speech II: Task-oriented Intelligent Communication for 6G and Beyond

Speaker: Prof. Byonghyo Shim, Seoul National University, South Korea

Chair: Prof. Mikio Hasegawa (Tokyo University of Science, Japan)

Abstract:

The rapid advancement of AI technologies is profoundly reshaping the way we live, work, and interact with the world. In this talk, we explore how AI will empower emerging autonomous systems, providing a compelling vision and motivation for future 6G systems. Particular attention is given to the convergence of physical AI and wireless communications, highlighting how autonomous tasks are related to wireless communication systems. Real-world demonstrations will be presented to illustrate the opportunities and challenges of AI-native wireless systems.



Biography

Byonghyo Shim (Fellow, IEEE) received the B.S. and M.S. degrees in control and instrumentation engineering from Seoul National University (SNU), South Korea, in 1995 and 1997, respectively, and the M.S. degree in mathematics and the Ph.D. degree in electrical and computer engineering from the University of Illinois at Urbana-Champaign (UIUC), Champaign, IL, USA, in 2004 and 2005, respectively.

From 1997 to 2000, he was an Officer (First Lieutenant) and an academic full-time Instructor with the Department of Electronics Engineering, Korean Air Force Academy. From 2005 to 2007, he was a Staff Engineer with Qualcomm Inc., San Diego, CA, USA. From 2007 to 2014, he was an Associate Professor with the School of Information and Communication, Korea University, Seoul. Since 2014, he has been with SNU, where he is currently a Professor with the Department of Electrical and Computer Engineering and the Director of the Institute of New Media and Communications. His research interests include wireless communications, statistical signal processing, and deep learning.

Dr. Shim was an Elected Member of the Signal Processing for Communications and Networking (SPCOM) Technical Committee of the IEEE Signal Processing Society. He was a recipient of the M. E. Van Valkenburg Research Award from the ECE Department, University of Illinois, in 2005, the Hadong Young Engineer Award from IEIE in 2010, the Irwin Jacobs Award from Qualcomm and KICS in 2016, the Shinyang Research Award from the Engineering College of SNU in 2017, the Okawa Foundation Research Award in 2020, the IEEE Comsoc AP Outstanding Paper Award in 2021, and the JCN Best Paper Award in 2024. He has been served as an Associate Editor for IEEE Transactions on Wireless Communications (IEEE TWC), IEEE Transactions on Communications (IEEE TCOM), IEEE Transactions on Vehicular Technology (IEEE TVT), IEEE Transactions on Signal Processing (IEEE TSP), IEEE Wireless Communications Letters (IEEE WCL), and Journal of Communications and Networks (JCN); and a Guest Editor for IEEE Journal on Selected Areas in Communications (IEEE JSAC).

July 08, 2026 (Wednesday), 14:10 ~ 15:00**Location: Auditorium, Ground Floor****Tutorial 1: ISAC for Physical-Layer Authentication in 6G Networks**

Speaker: Prof. Stefano Tomasin, University of Padova, Italy

Chair: Prof. Hyowoon Seo (Sungkyunkwan University, South Korea)

Abstract:

Next-generation cellular networks will feature native Integrated Sensing and Communication (ISAC), providing unprecedented capabilities for both network-centric and third-party applications. This tutorial explores the integration of ISAC within the network infrastructure to bolster communication security and establish a trusted link between users and base stations. We demonstrate how ISAC-derived Channel Knowledge Maps (CKM) can track user mobility to verify that uplink packets originate from the legitimate user's coordinates, effectively neutralizing spoofing or impersonation attacks. We further analyze the properties of physical-layer authentication, highlighting the "unclonable" channel features that serve as robust security primitives. Finally, we provide a strategic outlook on current research and standardization trends in physical layer security (PLS).

**Biography**

Stefano Tomasin received the Ph.D. degree from the University of Padova, Italy, in 2003. During his studies, he did internships with IBM Research (Switzerland) and Philips Research (Netherlands). He joined the University of Padova, where he is now Full Professor. He was visiting faculty at Qualcomm, San Diego (CA) in 2004, the Polytechnic University in Brooklyn (NY) in 2007, and was with Huawei in Paris (France) in 2015. His current research interests include physical layer security, security of global navigation satellite systems, signal processing for wireless communications, synchronization, and scheduling of communication resources. He has been an Editor of the IEEE Transactions on Vehicular Technologies (2011-2016), of the IEEE Transactions on Signal Processing (2017-2020), of the EURASIP Journal of Wireless Communications and Networking (2011-2024), and of the IEEE Transactions on Information Forensics and Security (since 2020). He also serves as a Deputy Editor-in-Chief of the IEEE Transactions on Information Forensics and Security since January 2023.

July 09, 2026 (Thursday), 14:00 ~ 14:50**Location: Auditorium, Ground Floor****Tutorial 2: Edge Network Intelligence for Distributed AI and Service Automation**

Speaker: Prof. Guido Maier and Prof. Sebastian Troia, Politecnico di Milano, Italy

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

Abstract:

Edge Network Intelligence is emerging as a key paradigm for future communication infrastructures, enabling distributed service delivery, real-time analytics, and AI-driven orchestration across cloud and edge domains. In this context, Software-Defined Wide Area Networking (SD-WAN) has evolved from a cost-effective alternative to traditional provider-managed wide-area networking solutions into a foundational enabler for intelligent edge networking and automation in enterprise and service provider environments. By decoupling the control and data planes and providing centralized policy-driven orchestration, SD-WAN enables dynamic traffic steering, automated service provisioning, real-time network analytics, and seamless integration with cloud and edge infrastructures.

This tutorial positions SD-WAN as a core enabling technology for Edge Network Intelligence, with direct relevance to emerging 6G scenarios characterized by ultra-low latency, pervasive connectivity, distributed AI, and programmable service delivery. In future 6G platforms, where networks evolve into intelligent and adaptive service fabrics, SD-WAN capabilities combined with AI/ML-driven network management can support dynamic service placement, SLA-aware routing, fine-grained traffic segmentation, adaptive resource scaling, and autonomous orchestration across distributed edge and cloud environments. The tutorial provides

a comprehensive overview of the technological foundations of Edge Network Intelligence, highlighting how SD-WAN facilitates automation, observability, and intelligent decision-making at the network edge. It will cover architectural principles, orchestration frameworks, AI-enhanced control mechanisms, and integration challenges, supported by practical use cases and experimental demonstrations that illustrate both current deployments and future research directions toward 6G intelligent networking ecosystems.

Biography



Guido Maier (Senior member IEEE), received his Laurea degree in Electronic Engineering at Politecnico di Milano (Italy) in 1995 and his Ph.D. degree in Telecommunication Engineering at the same university in 2000. Until February 2006 he has been researcher at CoreCom (research consortium supported by Pirelli in Milan, Italy), where he achieved the position of Head of the Optical Networking Laboratory. On March 2006 he joined the Politecnico di Milano as Assistant Professor. In 2015 he became Associate Professor. His main areas of interest are: optical network modeling, design and optimization; SDN orchestration and control-plane architectures; SD-WAN and NFV. He is author of more than 150 papers in the area of Networking published in international journals and conference proceedings (h-index 29) and 6 patents. He has been involved in industrial and European research projects, and is currently PI of the project WatchEDGE – NextGeneratioEU funds. In 2016 he co-founded the start-up SWAN networks, spin-off of Politecnico di Milano. He is editor of the journal Optical Switching and Routing, General Chair of DRCN 2020, DRCN 2021, IEEE NetSoft 2022 and IEEE HPSR 2025, and TPC member in many international conferences. He is IEEE Senior Member.



Sebastian Troia (member IEEE) is an Associate Professor at the Department of Electronics, Information and Bioengineering, Politecnico di Milano, Italy, and a Fulbright Fellow at the University of Texas at Dallas, USA. He received his Ph.D. in Information Technology (Telecommunications) cum laude from Politecnico di Milano in 2020 and is a partner at SWAN Networks, a Politecnico di Milano spin-off specializing in SDN/SD-WAN orchestration. His research focuses on Edge Network Intelligence and AI/ML for SDN, SD-WAN, and multi-layer optical/IP networks. He has contributed to several European projects, including H2020 Metro-Haul and NGI Atlantic, and served as an editor for the ITU-T FG-ML5G. He has authored over 80 publications and is active in TPC and organizing committees for major conferences such as IEEE ICC, GLOBECOM, NetSoft, and others. He is the founder and co-organizer of the Edge Network Softwarization (ENS) workshop series, now in its 5th edition in conjunction with IEEE NetSoft 2026. In 2025, he received the IEEE ComSoc EMEA Outstanding Young Researcher Award.

July 07, 2026 (Tuesday)

W1. 5G & 6G Communications Networks and Big Data 1

Chair: Laihyuk Park (Seoul National University of Science and Technology, South Korea)

Room A, Time 13:00~14:40

- [W1-01] Self-Directed Spectrum Allocation Framework for Integrated TN-NTN 6G Networks
Vaskar Chakma and Wooyeol Choi (Chung-Ang University, Korea (South))
- [W1-02] Implementation of a ZSM-Based Network Agent for Automated Traffic Detection and Unified Data Collection in Multi-Generation Networks
Mahn-suk Yoon (Gumi Electronics & Information Technology Research Institute, Korea (South)); Sunghun Lee (GERI, Korea (South))
- [W1-03] Two-Stage Rotor Micro-Doppler Detection in OFDM Sensing Using Mover Gating and Harmonic Signature Classification
Zahra Zarei and Chung G. Kang (Korea University, Korea (South))
- [W1-04] Energy-Aware Online Fog Scheduling for Mixed Agricultural Sensing Platforms
Trong-Minh Hoang (Posts and Telecommunications Institute of Technology, Vietnam); Thi-Thao Luu (East Asia University of Technology, Vietnam); Quang-Nam Nguyen and Quang-Khai Nguyen (Posts and Telecommunications Institute of Technology, Vietnam); Nhu-Ngoc Dao (Sejong University, Korea (South))
- [W1-05] AI-on-RAN in 6G: Architecture, Taxonomy, and Deployment Challenges for Integrated Intelligence
Jiwon Park (Chung-Ang University, Korea (South)); Yonggang Kim (Kongju National University, Korea (South)); Wooyeol Choi (Chung-Ang University, Korea (South))
- [W1-06] A Survey on Explainable Artificial Intelligence for Vehicle-to-Everything Communication Networks
Seongryool Wee, Heejae Park, SeungYeop Song and Laihyuk Park (Seoul National University of Science and Technology, Korea (South))
- [W1-07] Satellite Semantic Communication: A Survey on Architectures, Onboard Processing, and Inter-Satellite Networking
Tung Son Do, Thanh Phung Truong, The Vi Nguyen, Thi My Tuyen Nguyen, Seongjin Choi and Sungrae Cho (Chung-Ang University, Korea (South))

W2. International Workshop of AICT (Artificial Intelligence Converged Technology) 1

Chair: Prof. Myoung Jin Lee (Chonnam National University, South Korea)

Room B, Time 13:00~14:40

- [W2-01] Knowledge Graph-Based Propagation for Failure Localization in 5G Core Networks
Abubakar Isah (Chonnam National University, Korea (South) & Ahmadu Bello University Zaria, Nigeria); Ibrahim Aliyu, Seungmin Oh and Jaehyung Park (Chonnam National University, Korea (South)); Minsoo Hahn (Astana IT University, Korea (South)); Jinsul Kim (Chonnam National University, Korea (South))
- [W2-02] Cross-Modal Gated Fusion for Joint Anomaly Detection and Fault Category Diagnosis in Distributed Systems
Jihoon Lee, Juhyeon Noh and Jaehyung Park (Chonnam National University, Korea (South)); Ho Yong Ryu (ETRI, Korea (South)); Minsoo Hanh (Astana IT University, Kazakhstan); Jinsul Kim (Chonnam National University, Korea (South))
- [W2-03] Cascade Segmentation with L1-Norm Dice-Focal Loss for Tiny Lesion Detection in Medical Imaging
Sangwon Oh, Doyeon Kim, Jaeho Song, Yewon Lee, Yonggwon Won and Jinsul Kim (Chonnam National University, Korea (South))
- [W2-04] Evaluating Digital Forensic Readiness of Charging Station Management Systems Implementing OCPP
Jeck-Chae Euom (Chonnam National University, Korea (South)); Dong-Hyuk Shin (SSRC, Korea (South))
- [W2-05] A Nonlinear-Cross-Aware 13.56-MHz GaN Class-E Inverter Stage for kW-Class DC-DC Front-End Operation
Geon Kim, Ryun Kang, Dongyeong Kim, Suyeon Kim, Jewon Park, Shinwook Kim, Hyerin Lee and Myoung Jin Lee (Chonnam National University, Korea (South))

W3. International Workshop on Intelligent Vehicles

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

Room C, Time 13:00~14:40

- [W3-01] Does Image Deraining Improve Downstream Perception Tasks in Autonomous Driving?
George Albert Bitwire (Kyungpook National University, Korea (South)); Jung Hwan Kim (Kyungpook National University, Korea (South)); Dong Seog Han (Kyungpook National University, Korea (South))
- [W3-02] Pose-Graph Based Multi-Sensor Fusion for Indoor Mobile Robot Localization and Mapping
Lee Jin Yeong and Min Young Kim (Kyungpook National University, Korea (South))
- [W3-03] Redefinition of Inter-Message Arrival Time for Robust Controller Area Network Intrusion Detection
Rémi Bouchayer (Telecom SudParis - Institut Polytechnique de Paris, France & ECE Paris, France); Jae Yun Jun Kim (ECE Paris, France);

Hakima Chaouchi (Télécom SudParis, France); Philippe Millet (Nexter Systems, France)

- [W3-04] **A Ping-Assisted ISAC for Slot-Aware Medium Access Control for Underwater Acoustic Communications in AUV Swarms**
Yoon Kwon and Ho-Shin Cho (Kyungpook National University, Korea (South))
- [W3-05] **Socially Adaptive Robot Navigation via Emotion-Gesture Fusion**
Savina Jassica Colaco (Kyungpook National University & Center for ICT & Automotive Convergence, Korea (South)); Dong Seog Han (Kyungpook National University, Korea (South))
- [W3-06] **Natural Language-Driven Active AI Agent Camera System: LLM-Guided Semantic Anchor Modulation for Real-Time Edge Deployment**
Hyan su Bae (Electronics and Telecommunications Research Institute, Korea (South)); Jinhong Kim (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Yun-Won Choi (Electronics & Telecommunications Research Institute, Korea (South)); Jang Woon Baek (ETRI, Korea (South))

W4. Workshop on Smart System Security

Chair: Prof. Junbeom Hur (Korea University, South Korea)

Room D, Time 13:00~14:40

- [W4-01] **NFT Price-Prediction-Based Frontrunning Attack in Ethereum**
Juyeon Yi, Donghee Kim and Junbeom Hur (Korea University, Korea (South))
- [W4-02] **Exploring Potential Vulnerabilities in Decomposed Convolutional Filters for Federated Learning**
Jeawoon Jeong and Changhee Hahn (Seoul National University of Science and Technology, Korea (South))
- [W4-03] **FlatLeak-GEIA: Generative Text Inversion from Exact-KNN Score Leakage**
Junmo Kim and Changhee Hahn (Seoul National University of Science and Technology, Korea (South))
- [W4-04] **Reproducible Integrity Verification in Package Ecosystems**
Sangkyoung Park and Hyunsoo Kwon (Inha University, Korea (South))
- [W4-05] **Formal Verification of Token Replay Resistance Under DPoP for Single-Page Applications**
Jiyong Lee and Hyunsoo Kwon (Inha University, Korea (South))
- [W4-06] **Towards Bitcoin Mixer Deanonymization via Confirmation Time Prediction**
Donghee Kim and Juyeon Yi (Korea University, Korea (South)); Rihyun Kang (Ewha Womans University, Korea (South)); Junbeom Hur (Korea University, Korea (South))

W5. 5G & 6G Communications Networks and Big Data 2

Chair: Woongsoo Na (Kongju National University, South Korea)

Room A, Time 15:00~16:40

- [W5-01] **OTFS Modulation: A Promising Solution for LEO Satellite Communications**
The Vi Nguyen and Thi My Tuyen Nguyen (Chung-Ang University, Korea (South)); Tam Dinh Ton That (Chung Ang University, Korea (South)); Jaemin Kim and Sungrae Cho (Chung-Ang University, Korea (South))
- [W5-02] **Deep Learning-Based Semantic Image Communication for Satellite IoT Networks: A Survey**
Wondmagegn Ayalneh Bitew (Chung-Ang University, Korea (South)); Tam Dinh Ton That (Chung Ang University, Korea (South)); Thwe Thwe Win, Dongwook Won and Sungrae Cho (Chung-Ang University, Korea (South))
- [W5-03] **Large-Scale MIMO for Satellite Communications: Opportunities and Challenges**
Thi My Tuyen Nguyen, The Vi Nguyen, Hao Hoang Tran, Chihyun Song and Sungrae Cho (Chung-Ang University, Korea (South))
- [W5-04] **Dynamic Constellation Optimization for Quantum Key Distribution in LEO Satellite Networks**
Thanh Phung Truong, Tung Son Do, Seongjin Choi, Junsuk Oh, The Vi Nguyen and Sungrae Cho (Chung-Ang University, Korea (South))
- [W5-05] **Joint Trajectory and Scheduling Optimization for UAV-Assisted 6G Networks: A Deep Reinforcement Learning Approach with Throughput-Aol Trade-off**
Quang Tuan Do, Tung Son Do, Thanh Phung Truong, Dongwook Won and Sungrae Cho (Chung-Ang University, Korea (South))
- [W5-06] **Federated Deep Reinforcement Learning for MEC-UAV Network: A Survey**
Huy Dang Mac (Chung-Ang University, Korea (South)); Kiet Nguyen Tuan Tran (Chung Ang University, Korea (South)); Tung Son Do and Sungrae Cho (Chung-Ang University, Korea (South))
- [W5-07] **A Secure Hierarchical Federated Learning Architecture for UAV-Enabled Edge Computing Systems**
Tam Dinh Ton That (Chung Ang University, Korea (South)); Cuong Ho, Wondmagegn Ayalneh Bitew, Juyoung Kim, Junsuk Oh, The Vi Nguyen and Sungrae Cho (Chung-Ang University, Korea (South))

W6. International Workshop of AICT (Artificial Intelligence Converged Technology) 2

Chair: Prof. Myoung Jin Lee (Chonnam National University, South Korea)

Room B, Time 15:00~16:40

- [W6-01] **Uneven Learnability of Electrical Characteristics in TCAD-Derived LDMOS Surrogate Models**
Shinwook Kim, Geon Kim, Dongyeong Kim, Suyeon Kim, Jewon Park, Ryun Kang, Hyerin Lee and Myoung Jin Lee (Chonnam National University, Korea (South))

University, Korea (South))

- [W6-02] **Analysis of Total Ionizing Dose Effects in Buried Channel Array Transistors with Scaled Word-Line-Direction STI/Side-Gate Thickness**
Jewon Park, Geon Kim, Dongyeong Kim, Suyeon Kim, Shinwook Kim, Ryun Kang, Hyerin Lee and Myoung Jin Lee (Chonnam National University, Korea (South))
- [W6-03] **G-MAO: Gaze-Grounded Multi-Agent Orchestration for XR Document Understanding**
YunSu Lee and Seung-won Kim (Chonnam National University, Korea (South))
- [W6-04] **Design of Reinforcement Learning-Based Simulation Framework for Route and Energy Management of Autonomous Delivery Robots**
Ryun Kang, Geon Kim, Dongyeong Kim, Suyeon Kim, Jewon Park, Shinwook Kim, Hyerin Lee and Myoung Jin Lee (Chonnam National University, Korea (South))
- [W6-05] **Compressing the Supervised Target with Analytic Circuit Laws for Sparse-Label DRAM BLSA Margin Prediction**
Dongyeong Kim, Suyeon Kim, Jewon Park, Shinwook Kim, Ryun Kang, Hyerin Lee, Geon Kim and Myoung Jin Lee (Chonnam National University, Korea (South))

W7. International Workshop on Next Generation OCC and FSO

Chair: Prof. Yeong Min Jang (Kookmin University, South Korea)

Room C, Time 15:00~16:40

- [W7-01] **Propagation-Model Sensitivity in Urban VANETs: A SUMO-ns-3 Benchmark Across Traffic Load Scenarios**
Sang-Chul Kim and Zuoqian Zhou (Kookmin University, Korea (South))
- [W7-02] **A Stability-Driven Clustering Scheme for Uninterrupted Federated Learning in UAV Networks**
Su-Gyeong Kim and Woonghee Lee (Dongguk University, Korea (South))
- [W7-03] **RF-LiTE: An Ultra-Lightweight Linear-Attention Network for RSSI-Based Indoor Localization**
Ida Bagus Krishna Yoga Utama (Kookmin University, Korea (South)); Jaeyun Yoo (Electronics and Telecommunication Research Institute, Korea (South)); Yeong Min Jang (Kookmin University, Korea (South))
- [W7-04] **UWB PDoA-Based Localization for Vision Sensor Alignment in Optical Camera Communication**
MinJun Kim, UkHyun Jeong and SeungHo Yoo (Pukyong National University, Korea (South))
- [W7-05] **A Deep Learning-Based Vehicular Optical Camera Communication System**
Huy Nguyen and Yeong Min Jang (Kookmin University, Korea (South))

W8. Korea-Finland Joint Research Program on Semantic Communication

Chair: Hyowoon Seo (Sungkyunkwan University, South Korea)

Room D, Time 15:00~16:40

- [W8-01] **Distribution-Level AirComp for Bayesian FL**
Jun-Pyo Hong (Hongik University, Korea (South)); Hyowoon Seo (Sungkyunkwan University, Korea (South)); Kisong Lee (Dongguk University, Korea (South))
- [W8-02] **Spatial CRLBs for RIS-Aided Monostatic Self-Localization**
Eunae Choi (Chungnam National University, Korea (South)); Yu Ge (Massachusetts Institute of Technology, USA); Hyowon Kim (Chungnam National University, Korea (South))
- [W8-03] **On the Optimal Number of Participating Clients in NOMA-Based Federated Learning Under Imperfect SIC**
JongHyuk Lee and Hyowoon Seo (Sungkyunkwan University, Korea (South))
- [W8-04] **Channel Estimation for Multi-RIS Wireless Systems: A Brief Taxonomy and near-Field Perspective**
Donghyeon Ban and Hyowoon Seo (Sungkyunkwan University, Korea (South))
- [W8-05] **IoV-Assisted Semantic Communication for Occlusion-Aware Edge Autonomous Driving**
Tri Thanh Ho, Yekang Han, Seongbin Yun and Hyowoon Seo (Sungkyunkwan University, Korea (South))
- [W8-06] **A Survey on UAV-Assisted Wireless Communications for Future Networks**
Jueun Jeong, Sehyeon Kwon, Changhui Kim and Hyowoon Seo (Sungkyunkwan University, Korea (South))

W9. 5G & 6G Communications Networks and Big Data 3

Chair: Laihyuk Park (Seoul National University of Science and Technology, South Korea)

Room A, Time 16:50~18:30

- [W9-01] **A Survey for Integrating FAS, RIS, and Hybrid NOMA-MEC in 6G Wireless Network**
Kiet Nguyen Tuan Tran (Chung Ang University, Korea (South)); Huy Dang Mac, Tung Son Do and Sungrae Cho (Chung-Ang University, Korea (South))
- [W9-02] **Toward Low-Latency Privacy-Preserving Federated Learning in Fluid Antenna Systems with Homomorphic Encryption**
Cuong Ho (Chung-Ang University, Korea (South)); Tam Dinh Ton That and Kiet Nguyen Tuan Tran (Chung Ang University, Korea (South)); Huy Dang Mac, Junsuk Oh, Donghyun Lee, Chihyun Song and Sungrae Cho (Chung-Ang University, Korea (South))
- [W9-03] **A Survey on Caching in Semantic Communication**
Thwe Thwe Win, Wondmagegn Ayalneh Bitew, Cuong Ho, Junsuk

Oh, Juyoung Kim and Sungrae Cho (Chung-Ang University, Korea (South))

[W9-04] Toward End-to-End Intent-Based Networking for 6G: Architectures, Challenges, Recent Advances, and Future Directions

Dongwook Won and Thanh Thien-An Dang (Chung-Ang University, Korea (South)); Tam Dinh Ton That (Chung Ang University, Korea (South)); Wondmagegn Ayalneh Bitew, Hao Hoang Tran, Seungchan Lee and Juyoung Kim (Chung-Ang University, Korea (South)); Kiet Nguyen Tuan Tran (Chung Ang University, Korea (South)); Sungrae Cho (Chung-Ang University, Korea (South))

[W9-05] Robust PRACH Preamble Detection Using GATv2-Based Graph Learning for 5G/6G Networks

Viet Anh-Huy Le, Anh-Tien Tran, Thanh Thien-An Dang and Sungrae Cho (Chung-Ang University, Korea (South))

[W9-06] Toward Event-Driven Per-UE xApps in Open RAN near-RT RIC

Thanh Thien-An Dang, Dongwook Won, Juyoung Kim, Viet Anh-Huy Le, Jaemin Kim and Sungrae Cho (Chung-Ang University, Korea (South))

[W9-07] Vacuum QoS Constraints in Constrained DRL-URLLC Simulations: Root Causes, Detection, and Remedies

Hao Hoang Tran, The Vi Nguyen, Thi My Tuyen Nguyen, Dongwook Won, Junsuk Oh and Sungrae Cho (Chung-Ang University, Korea (South))

W10. International Workshop of AICT (Artificial Intelligence Converged Technology) 3

Chair: Prof. Ieek-Chae Euom (Chonnam National University, South Korea)

Room B, Time 16:50~18:30

[W10-01] A New Dual-Engine Error Recovery Scheme for High-Reliability HBM

Keonwoo Kim and Heonjun Min (Inha University, Korea (South)); Jungin Park (Hyundai Motor Company, Korea (South)); Young-woo Lee (Inha University, Korea (South))

[W10-02] WTM-Aware Shift Direction Selection for Low Power Bidirectional Scan Testing

Donghyun Kim and Juhyun Park (Inha University, Korea (South)); Jungin Park (Hyundai Motor Company, Korea (South)); Young-woo Lee (Inha University, Korea (South))

[W10-03] AI-Based Prediction of Coupling Effects on Transistor Switching Performance in DRAM

Suyeon Kim, Geon Kim, Dongyeon Kim, Shinwook Kim, Jewon Park, Ryon Kang, Hyerin Lee and Myoung Jin Lee (Chonnam National University, Korea (South))

[W10-04] Communication-Aware Adaptive Decentralized Traffic Signal Control via Broadcast Gate

Minjun Choi, Geonmin Kim, Hyeonji Jang, Md Ilias Bappi and Kyungbaek Kim (Chonnam National University, Korea (South))

[W10-05] Surrogate-Assisted Boundary Search Importance

Sampling for Failure Probability Estimation of Offset-Compensated Sense Amplifiers

Hyerin Lee, Geon Kim, Dongyeon Kim, Suyeon Kim, Jewon Park, Shinwook Kim, Ryon Kang and Myoung Jin Lee (Chonnam National University, Korea (South))

W11. Next-Generation Intelligent Sensing and Communications

Chair: Prof. Jingon Joung (Chung-ang University, South Korea)

Room C, Time 16:50~18:30

[W11-01] Autoregressive Model-Based Signal Reconstruction for OCDM-Induced Interference Mitigation in FMCW-Based Sensing Systems

Heekwon Yoon and Seongwook Lee (Chung-Ang University, Korea (South))

[W11-02] Velocity Disambiguation and Doppler-Induced Interference Mitigation for SC-OFDM Systems in High-Mobility Scenarios

Yeong Choi and Seongwook Lee (Chung-Ang University, Korea (South))

[W11-03] AI-Based Estimation of the Active Relay Count Using Received Power

Geun Won Choi, Eui-Rim Jeong and Soyeon Jeon (Hanbat National University, Korea (South))

[W11-04] Experimental Validation of Random Phase Rotation for SC-FDE Systems in BRN Environments

Deuk-Han Lee, Soyeon Jeon, Geun Won Choi and Eui-Rim Jeong (Hanbat National University, Korea (South))

[W11-05] DNN-Based 3D Relative Positioning Using Inter-Node Distances in Indoor Environments

Euna Ko, Deuk-Han Lee, Geun Won Choi and Eui-Rim Jeong (Hanbat National University, Korea (South))

[W11-06] Low-Cost Wideband Intelligent Reflective Surface Using Vanadium Dioxide Switches with Magneto-electric (ME) Dipole Resonance for 6G Communications

Hyojin Jang, Junghyeon Kim and Sungjoon Lim (Chung-Ang University, Korea (South))

[W11-07] Fully Additive Manufacturing of 2.5D RF Circuits

Seyeon Park, Junghyeon Kim and Sungjoon Lim (Chung-Ang University, Korea (South))

W12. Workshop on Smart Radio for IoT Era 1

Chair: Prof. Takeo Fujii (The University of Electro-Communications, Japan)

Room D, Time 16:50~18:30

[W12-01] Robust mmWave Beam Tracking with Bounded Updates Against CAM Latency and Location Errors

Jin Nakazato, Yuki Sasaki, Ryoichi Nori, Keishi Hijikata, Mayu

Selena Horiuchi and Mikio Hasegawa (Tokyo University of Science, Japan); Haruki Osaki and Tetsuya Iye (Kozo Keikaku Engineering Inc., Japan); Kazuki Maruta (Tokyo University of Science, Japan); Rui Dinis (Universidade Nova de Lisboa & Nova IT, FCT-UNL, Portugal)

[W12-02] A Study on Predicting Channel Occupancy Rate of New Terminals Using Occupancy Rate Notification in WLAN
Kazuki Kuwabara and Osamu Takyu (Shinshu University, Japan); Takeo Fujii (The University of Electro-Communications, Japan)

[W12-03] Value-Aware Packet Dropping with Dynamic Threshold Control Based on Queue Congestion Using Programmable Data Planes
Midori Kawaguchi (Kyushu Institute of Technology, Japan); Yuzo Taenaka (Nara Institute of Science and Technology, Japan); Kazuya Tsukamoto (Kyushu Institute of Technology, Japan)

[W12-04] Obstacle-Aware Interpolation for Real-Time Radio Map Generation in Smart Factories
Tatsuki Omori, Tatsuya Hatagi, Taketo Kakimoto, Masataka Miyake and Suguru Kameda (Hiroshima University, Japan)

[W12-05] Evaluation of the Impact of Timing Synchronization Errors in Synchronized SS-CDMA Under Massive Connectivity
Sho Kanazawa, Tomokazu Watanabe, Toshiki Ouchi, Masataka Miyake and Suguru Kameda (Hiroshima University, Japan)

[W12-06] Comparative Evaluation of Required Satellite Count for OTFS and OFDM in LEO Communications
Nozomi Nakai, Ryo Arimura, Kensuke Kawaguchi, Masataka Miyake and Suguru Kameda (Hiroshima University, Japan)

July 08, 2026 (Wednesday)

W13. 5G & 6G Communications Networks and Big Data 4

Chair: Woongsoo Na (Kongju National University, South Korea)

Room A, Time 09:00~10:40

[W13-01] A Survey on LLM-Based Network Resource Optimization
Junyoung Park (Kongju-National University, Korea (South)); Woongsoo Na (Kongju National University, Korea (South))

[W13-02] A Survey of AI-Based Resource Management and QoS Modeling in 6G Space-Air-Ground Integrated Networks: A Three-Axis Taxonomy
Minjae Go and Woongsoo Na (Kongju National University, Korea (South))

[W13-03] Toward Fusion Intelligence of Open Radio Access Network with Federated Learning: A Survey
Junsuk Oh, Donghyun Lee, Chunghyun Lee, Dongwook Won, Jaemin Kim, Chihyun Song, Hao Hoang Tran, Thanh Phung Truong, Thwe Thwe Win and Thi My Tuyen Nguyen (Chung-Ang University, Korea (South)); Tam Dinh Ton That (Chung Ang University, Korea (South)); Sungrae Cho (Chung-Ang University, Korea (South))

[W13-04] A Comparative Study of WiFi CFR Based Human Activity Recognition Using Time Series Classification Model
Gwangun Yu and Yonggang Kim (Kongju National University, Korea (South))

[W13-05] Research Trends in Channel Estimation for Dynamic Metasurface Antennas
Donghyun Lee, Junsuk Oh, Chihyun Song and Sungrae Cho (Chung-Ang University, Korea (South))

[W13-06] A Survey on O-RAN Architectures: Scheduler, and Beamforming
Chihyun Song, Junsuk Oh, Donghyun Lee, Jaemin Kim, Dongwook Won and Sungrae Cho (Chung-Ang University, Korea (South))

W14. Smart Mobility Connectivity

Chair: Prof. Ji-Woong Choi (DGIST, South Korea)

Room B, Time 09:00~10:40

[W14-01] Traffic-Burst-Resilient Queue-Adaptive Load Balancing for Edge-Assisted Autonomous Vehicles
Hanyoung Park (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Ho-Jun Lee (Seoul National University of Science and Technology, Korea (South)); Yongjae Jang (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Ji-Woong Choi (DGIST, Korea (South))

[W14-02] Infrastructure-Free V2V Key Repair for Threshold BLS Signatures in Autonomous Vehicle Platoons
Sangwoo Cho, Woosang Im and Gihyeon Shin (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Young-Sik Kim (Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea (South))

[W14-03] Vehicle Speed-Aware Jammer-Resilient Receiver for Multi-User MIMO V2X Systems
Hanyoung Park and Yongjae Jang (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Ji-Woong Choi (DGIST, Korea (South))

[W14-04] Learning-Based Resource Allocation in 5G NR Mode-2 Sidelink for Industrial AGV and AMR Communications
Mahmoud Elsharief, Kiwoong Park and Han-Shin Jo (Hanyang University, Korea (South))

[W14-05] EMC Testing Configuration and Performance Assessment for in-Vehicle Cellular Communication Systems
Juhyeok Kim, Seunggon Park, Junhee Park, Hwankyung Song, Hyok Lee and Wonsun Chung (Korea Automotive Technology Institute, Korea (South))

[W14-06] What Will Target Applications of AI-RAN Be?
Jeongho Kwak (Korea University), Dongho Ham (DGIST)

W15. Workshop on RISE ICT-ABB

Chair: Joon-Goo Park (Kyungpook National University, South Korea)

Room C, Time 09:00~10:40

[W15-01] Toward a Korean-Specific 6G NTN: Trends, Limitations, and Key Enabling Technologies
Byungchan Kwon (Kyungpook National University & Korea Aerospace Research Institute, Korea (South)); Eunjeong Jo and Hoki Baek (Kyungpook National University, Korea (South))

[W15-02] High-Resolution Multi-Human Micro-Doppler Sensing with OFDM-Based ISAC
Yunhwa Shin (Kyungpook National University, Korea (South)); Sangwoo Shin (Kyungpook National University, Korea (South)) & WCSL, Korea (South)); Woo Hyun Jee, Subin Cho and Jeongsik Choi (Kyungpook National University, Korea (South))

[W15-03] A RSSI Attenuation Model Considering Incident Angle and Wall Thickness in Indoor Environments
Hwang Jun Gyu (Kyungpook National University, Korea (South)); Kim Sae-Wan (Gumi Electronics & Information Technology Research Institute, Korea (South)); JoonGoo Park (Kyungpook National University, Korea (South))

[W15-04] PMCW Radar Interference Mitigation Using Phase-Randomization and Coherent Accumulation
Hyeonjun Shin (Kyungpook National University, Korea (South)); Seungha Ryu (Kyungpook National University, Korea (South), Korea (South)); Jeongsik Choi (Kyungpook National University, Korea (South))

[W15-05] A Study for Increasing Commercial Temperature Sensor Accuracy Without Specialized Equipment Using Algorithmic Calibration
YunSoo Jeon (Kyungpook National University, Korea (South)); Jeongmin Kim, Chiseung Roh and Chanho Han (KyungPook National University, Korea (South))

[W15-06] Development of an Integrated Control and Management System for Software-Defined Camera
Jinhong Kim (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Yun-Won Choi (Electronics & Telecommunications Research Institute, Korea (South)); Jang Woon Baek (ETRI, Korea (South)); Hyan su Bae (Electronics and Telecommunications Research Institute, Korea (South)); Dongkyun Kim (Kyungpook National University, Korea (South))

W16. Workshop on Smart Radio for IoT Era 2

Chair: Prof. Osamu Takyu (Shinshu University, Japan)

Room D, Time 09:00–10:40

[W16-01] Cooperative Terrestrial Radio Source Localization Using a LEO Satellite and HAPS
Kotaro Sugimura (University of Electro-Communications, Japan); Takeo Fujii (The University of Electro-Communications, Japan); Osamu Takyu (Shinshu University, Japan); Kei Inage (Tokyo Metropolitan College of Industrial Technology, Japan)

[W16-02] Adaptive Channel Selection and Traffic Allocation for IEEE 802.11be MLO Using a Distributed Spectrum Management Database

Koichi Eto, Daiki Nobayashi and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)

[W16-03] Dynamic Transmission Switching Using Multiple Wi-Fi Links for Bulk Data Transfer on Mobile Vehicles
Nobuki Sumitomo, Daiki Nobayashi and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)

[W16-04] Store-and-Forward-Based Data Transfer Control for ROS 2 Topic Communication in Mobile Nodes
Tomohiko Sannomiya, Daiki Nobayashi and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)

[W16-05] Adaptive Payload Length Control for Uplink Communications in LoRa-Based LEO Satellite IoT Networks
Sakutaro Anzai and Daiki Nobayashi (Kyushu Institute of Technology, Japan); Kenichi Takizawa (National Institute of Information and Communications Technology, Japan); Kazuya Tsukamoto, Takeshi Ikenaga and Nova Khamsah (Kyushu Institute of Technology, Japan); Goshi Sato (NICT, Japan)

W17. The International Workshop on Beyond-6 Networks: AI-Native RAN and Intelligent ISAC

Chair: Prof. Sunwoo Kim (Hanyang University, South Korea)

Room A, Time 15:20–17:00

[W17-01] Isolation-Enhanced Shared-Radiator Antenna Enabling Wide-Angle Beam Scanning for IBFD-Based 6G Communication
Jun-Hyeon Kang, Myeong-Jun Kang, Jaehoon Cho and Sunwoo Kim (Hanyang University, Korea (South))

[W17-02] Joint Acquisition and Satellite Identification with Search Space Reduction in Opportunistic LEO-PNT
Wonyoung Choi, Duhui Yang and Sunwoo Kim (Hanyang University, Korea (South))

[W17-03] Double Layer DSO Based Joint Positioning and Beam Synthesis in UAV Swarms
Seyeon Lee (Hanyang University, Korea (South)); Seongkwon Yoon (Hanyang University, Seoul, South Korea, Korea (South)); Hongseok Jung and Sunwoo Kim (Hanyang University, Korea (South))

[W17-04] Geometry-Guided Self-Supervised Learning for Label-Free 3D Indoor Radio Sensing
Seungwoo Han, Hongseok Jung and Sunwoo Kim (Hanyang University, Korea (South))

[W17-05] ML-Based Multiple BS Beam Tracking and Positioning with Digital Twin
Donggeon Kim, Woongbin Doh, Hyunwoo Park and Sunwoo Kim (Hanyang University, Korea (South))

[W17-06] Bluestein-Based DAFT Implementation on FPGA for AFDM
Hyeryeon Jung, Adam P Dubs and Sunwoo Kim (Hanyang University, Korea (South))

July 08, 2026 (Wednesday)**01. Security, Military, and Defense 1***Chair: Prof. Taeheon Kim (Hanbat National University, South Korea)***Room B, Time 15:20~17:00**

- [01-01] **Bounded Uncertainty-Aware EIS-Based SoH for Mission-Critical Autonomous Systems**
Mauro Danesi, Chiara Arcieri, Andrea Pirisi, Emanuele Ogliari and Riccardo Enrico Zich (Politecnico di Milano, Italy)
- [01-02] **Energy-Sustainable Federated AI Services for Ubiquitous Remote Patient Monitoring in Battery-Constrained IoMT**
Chigozie Athanasius Nnadiakwe (Kumoh National Institute of Technology, Korea (South)); Simeon Okechukwu Ajakwe (Kyungdong University, Global Campus, Korea (South)); Josiah Ayoola Isong, Jae-Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))
- [01-03] **Robust Invertible Image Steganography for Noisy Channel Transmission**
Wei Bingxin and Haewoon Nam (Hanyang University, Korea (South))
- [01-04] **Improving TTP Mapping Accuracy in CTI Reports Using Structured RAG Query Configuration**
Seoyeon Kim, Saewoom Lee, Seul-Ki Choi, Taehyeon Kim and Taeun Kim (Korea Internet & Security Agency, Korea (South))
- [01-05] **Transformer-Based Digital Twin for Stem Cell Differentiation Forecasting with Mechanistic ODE Benchmarking**
Victor Ikenna Kanu, Ihunanya Udodiri Ajakwe and Josiah Ayoola Isong (Kumoh National Institute of Technology, Korea (South)); Simeon Okechukwu Ajakwe (Kyungdong University, Global Campus, Korea (South)); Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

02. Communications and Networks for B5G and 6G 1*Chair: Dr. Muhammad Azfar Yaqub (Free University of Bozen-Bolzano, Italy)***Room C, Time 15:20~17:00**

- [02-01] **A Resilience-Enhancing Approach to Reducing Traffic Downtime Under Consecutive Failures in Backbone Networks**
Trung Van Vu, Thien Van La, Quyet Hoang Dinh, Huong Van Tran, Trang Hanh Nguyen and Tho Dinh Luong (Viettel High Technology Industries Corporation, Vietnam)
- [02-02] **TATM: A Proactive Flow-Aware Buffer Allocation Framework for Efficient Micro-Burst Absorption in Commodity Switches of 5G Networks**
Tien Duy Bui, Huong Van Tran, Thien Van La, Quyet Hoang Dinh and An Duc Nguyen (Viettel High Technology Industries Corporation, Vietnam)

- [02-03] **Pilot-Data Power Allocation in Multi-Cell Multi-RIS Networks**
Sungyun Oh, Sangho Kim and Heejung Yu (Korea University, Korea (South))
- [02-04] **Integrated Sensing and Communications in 6G: A Review of Recent Advances and Challenges**
Duc-Nghia Vu (Viettel High Technology Industries Corporation, Vietnam); Duc Tai Truong (Viettel High-Technology Industries Corporation, Vietnam); Tu Anh Nguyen (Viettel High Technology Industries Corporation, Vietnam); Tung Van Tran (Viettel Group, Vietnam); Tuan Duc Vu (Viettel High Technology, Viettel Group, Vietnam); Tuyen Duc Nguyen (Viettel High Technology Industries Corporation, Vietnam)
- [02-05] **Joint Power Allocation for NDP, Pilot and Data Phases in ISAC-PLS Systems**
Ji Min Park, YoungHoon Kim, Junseok Lee and Heejung Yu (Korea University, Korea (South))

03. AI and Its Applications 1*Chair: Prof. Suk-Seung Hwang (Chosun University, South Korea)***Room D, Time 15:20~17:00**

- [03-01] **The Role of AI and Machine Learning in Next-Generation Governance, Risk, and Compliance (GRC) Platforms**
Saikrishna Tarakampet (California's Correctional Healthcare Services, USA); Subhash Tatavarthi (Kasmo, USA); Ganesh Puvvula (USA)
- [03-02] **Deployment-Oriented Targetless Radar-Camera Extrinsic Auto-Calibration for Fixed Roadside Monitoring**
Sun Hong Jung, Seung Yun Noh, Chan Gyu Park and Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [03-03] **Dual-Distance-Based Goal Representation Learning**
Nahyeon Kwon and Junghyun Kim (Sejong University, Korea (South))
- [03-04] **Retraining Data Poisoning Attacks on Drift Adaptive Anomaly Detection for Industrial Control Systems**
Jung Kyu Seo, JuHyeon Lee and Jung Taek Seo (Gachon University, Korea (South))
- [03-05] **CCGP: A Cooperative Coevolutionary Cartesian Genetic Programming Algorithm for Finite State Machine Synthesis**
Siyu Lin and Huikun Huang (Jinan University, China); Xin Yuan Zhang (JINAN University, China); Jun Zhang (Hanyang University, Ansan, South Korea)

July 09, 2026 (Thursday)**04. Security, Military, and Defense 2***Chair: Prof. Insoo Sohn (Dongguk University, South Korea)***Room A, Time 09:00~10:40**

- [04-01] **Secure and Resilient Cyber-Physical Supply Networks for Critical Infrastructure a Design Framework for Military Mobility and Mission-Critical Operations**
Franco Maciariello (Universitas Mercatorum, Italy & Arts & Humanities Centro Studi Avanzati per l'Intelligenza, Italy); Fabrizio Benelli (Universitas Mercatorum, Italy); Veronica Elena Bocci (Vice President European Railway Clusters Initiative (ERIC) ASBL Brussels, Belgium); Eddi Lorenzi and Claudio Salvadori (New Generations Sensors srl, Italy)
- [04-02] **Multi-Dimensional Vulnerability Analysis of LM Safety Guards via Role-Goal-Format Decomposition**
Jin Seong Kim, Han Ju Lee, Hyeon-Jin Jeong and Seok-Hwan Choi (Yonsei University, Korea (South))
- [04-03] **An Empirical Study on the Privacy Effects of Model Merging in Vision Language Models**
Han Ju Lee and Jin Seong Kim (Yonsei University, Korea (South)); Chansu Han and Geon-Kyu Bang (National Institute of Information and Communications Technology, Japan); Seok-Hwan Choi (Yonsei University, Korea (South)); Takeshi Takahashi (National Institute of Information and Communications Technology, Japan)
- [04-04] **Mutual Coupling-Aware Spatially Selective Beamforming for RIS-Assisted Physical Layer Secure Transmission**
Sumin Jeong (Kumoh National Institute of Technology, Korea (South))
- [04-05] **Pure-LBVR: A PureChain-Anchored Storage Fabric with Latency-Bounded Verifiable Retrieval for Safety-Critical Federated Systems**
Josiah Ayoola Isong (Kumoh National Institute of Technology, Korea (South)); Paul Angelo Oroceo (Kumoh National Institute of Technology, Korea (South)); Jae-Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))

05. Communications and Networks for B5G and 6G 2*Chair: Prof. Yonggang Kim (Kongju National University, South Korea)***Room B, Time 09:00~10:40**

- [05-01] **Distortion-Aware LLR for OFDM Systems with PAPR Reduction in LEO Satellite Link**
Hee Ju Kwak, Somin Park and Cheolwoo You (Myongji University, Korea (South))
- [05-02] **UAV Trajectory Planning for RIS-Assisted Data Collection**
Pei-Fa Sun and Sang-Woon Jeon (Hanyang University, Korea (South))
- [05-03] **Holographic-ELAA-Enabled near-Field ISAC: A Sensing-Centric Beamforming Design**

Kangyu Gao (Hanyang University, Korea (South)); Sung Ho Chae (Kwangwoon University, Korea (South)); Sang-Woon Jeon (Hanyang University, Korea (South))

- [05-04] **A Hierarchical Multi-RAT MEC Framework with LLM-Based EC Method**
Zhaokun Shao and Kangyu Gao (Hanyang University, Korea (South)); Zhi-Hui Zhan (Nankai University, China); Sang-Woon Jeon and Jun Zhang (Hanyang University, Korea (South))
- [05-05] **Machine Learning-Based Secure Beam Selection Under Beam Squint for mmWave LEO Satellite Communication Systems**
Minjeong Kang and Jung Hoon Lee (Hankuk University of Foreign Studies, Korea (South))

06. Communications and Networks for B5G and 6G 3*Chair: Prof. Sumin Jeong, (Kumoh National Institute of Technology, South Korea)***Room C, Time 09:00~10:40**

- [06-01] **CSI-Free Gamma CDF-Based Distributed User Scheduling for IRS-Aided Multi-User Systems**
Jae Hyun Park, Junsu Kim and Su Min Kim (Tech University of Korea, Korea (South))
- [06-02] **Evaluation of GNSS Delay Compensation for GEO and LEO Satellite Communications: Impact of Seasonal Variations and Sky View Factor**
Takuma Nagai and Hiroshi Oguma (National Institute of Technology, Toyama College, Japan); Suguru Kameda (Hiroshima University, Japan)
- [06-03] **Design and Validation of NCR Coverage Virtualization for End-to-End Network Slicing**
Seung-Que Lee, JunHwan Lee and Moon-Sik Lee (Electronics and Telecommunications Research Institute, Korea (South))
- [06-04] **A 5G Testbed for AI-and-RAN on AI Edge: Design and Performance Evaluation**
Tae-il Jung (KyungHee University, Korea (South)); Hyun-Min Yoo and Een-Kee Hong (Kyunghee University, Korea (South)); Jeehyeon Na and Kyung Sook Kim (ETRI, Korea (South))
- [06-05] **CV Quantum Communications with Angular Rejection Filtering: Modeling and Security Analysis**
Mohammad Taghi Dabiri (Qatar University, Qatar); Meysam Ghanbari (Hamad Bin Khalifa University, Qatar); Rula Ammuri (Professionals for Smart Technology, Jordan); Saif Al-Kuwari (Hamad Bin Khalifa University, Qatar); Mazen Omar Hasna (Qatar University, Qatar); Khalid A. Qarage (Hamad Bin Khalifa University & College of Science and Engineering, Qatar)

07. AI and Its Applications 2*Chair: Prof. Taesoo Jun (Kumoh National Institute of Technology, South Korea)***Room D, Time 09:00~10:40**

- [07-01] Unified Accident Anticipation and Explainable Report Generation via Self-Supervised Vision-Conditioned Language Modeling
Ahmed Dawod Mohammed Ibrahim, Muhab Ramadan A Alakroot, Zhengyu Shang and Jang-Eui Hong (Chungbuk National University, Korea (South))
- [07-02] Communication-Aware Multi-Agent Reinforcement Learning for Cooperative UAV Swarm Decision-Making in Smart City Surveillance
Mingyu Shin and Soyi Jung (Ajou University, Korea (South))
- [07-03] PASTEL: Pose-Aware Spatio-Temporal Event Localization of Interactions in Multi-View Retail Videos
Sungwoo Byeon, Junwon Son and Rakwon Choi (Safe AI, Korea (South)); Junho Shin and Seokjun Lee (Focus AI, Korea (South)); Wonsuk Kim (Safe AI, Korea (South))
- [07-04] Offline Neighbor Cell List Planning for Cold-Start Mitigation Using Machine Learning and Radio Frequency Coverage Data
Tiago Afonseca (ISCTE - Instituto Universitário de Lisboa, Portugal); Ricardo Costa and Joao Martins (Multivision, Portugal); Gabriela Soares and Luis Nunes (Iscte, Portugal); Pedro Sebastião (ISCTE-IUL, Portugal)
- [07-05] Natural Language-Driven Analytics for Networked Photovoltaic Systems Using LLM-Based Agents
Mattia Fontana and Marcello Polenghi (Universitas Mercatorum, Italy)

08. Security, Military, and Defense 3

Chair: Prof. Taesoo Jun (Kumoh National Institute of Technology, South Korea)

Room A, Time 10:50~12:30

- [08-01] Homogeneous vs. Heterogeneous UAV Fleets for Critical Infrastructure Surveillance: An Event-Driven Monte Carlo Simulation Under Environmental Network Stress
Alberto Croci and Marco Luigi Dinapoli (Politecnico di Milano, Italy); Luca Bettocchi and Sara Cavagna (Polytechnic Institute of Milan, Italy); Gabriel Felipe Martinez, Andrea Pirisi and Riccardo Enrico Zich (Politecnico di Milano, Italy)
- [08-02] Fingerprint Reconstruction from Biometric Templates Using Context Aware Minutiae Representation
Aleksandar Mijatović, Peter Peer and Tim Oblak (University of Ljubljana, Slovenia)
- [08-03] ISO/SAE 21434-Compliant Asset Modelling for TARA of Electric Vehicle BMS
Esmot Ara Tuli and Mubashrah Saddiq (University of Southern Denmark, Denmark); Mehmet Emre Aslaci and Abdullah Hocaoglu (MEAtec Engineering Ltd., Turkey)
- [08-04] LAVA-Control: Stable Cost-Aware Intelligence Density Adaptation for Distributed IDS in Heterogeneous IoT Networks

Jonathan Mukisa Kalibbala (Kumoh National Institute of Technology, Gumi, Korea (South)); Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))

- [08-05] PureChain-Based Real-Time Intrusion Detection for Secure Industrial Humanoid IIoT Communication
Hamza Ibrahim, Love Allen Chijioke Ahakonye, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))
- [08-06] A Study of a Frequency-Separation-Based and Access-Controlled Reversible Video de-Identification System for Edge Environments
Ye-Lim Kim, Sunoh Yun, In-nea Wang, Kang-Woo Lee and Junho Jeong (Dongguk University, Korea (South))

09. Communications and Networks for B5G and 6G 4

Chair: Prof. Ji-Woong Choi (DGIIST, South Korea)

Room B, Time 10:50~12:30

- [09-01] A Compact Wideband Vivaldi Probe Antenna for 6G OTA Measurement Systems
Cheol Yoon (tech University of Korea, Korea (South)); Chul Woo Lee, Hwa-Choon Lee and Woo Su Kim (Tech University of Korea, Korea (South))
- [09-02] Adaptive Registration Procedure for Roaming Scenarios in IP Multimedia Subsystem
Lam Nguyen The, Huy Duc Nguyen, Hieu Minh Do, Van Minh Nguyen and Vuong Ngo (Viettel High-Technologies Industries Corporation, Vietnam)
- [09-03] Performance Investigation of Turbo Coded Underwater Acoustic Multihop Networks
Andrej Stefanov (IBU Skopje, Macedonia, the former Yugoslav Republic of)
- [09-04] Maximum a Posteriori Generative Channel Estimation for Massive MIMO Systems
Moonil Kim (Sogang University, Korea (South)); Il-Min Kim (Queen's University, Canada); Jaewoo So (Sogang University, Korea (South))
- [09-05] Pure-FAN: An Explainable AI for Cross-Layer Intrusion Detection in Flying Adhoc Networks
Odinachi Udemezuo Nwankwo (Kumoh National Institute of Technology, Korea (South)); Muhammad Rasyid Redha Ansori (NS Lab Inc., Korea (South)); Gifar Arif Haryadi, Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))

010. Communications and Networks for B5G and 6G 5

Chair: Prof. Insoo Sohn (Dongguk University, South Korea)

Room C, Time 10:50~12:30

- [010-01] Deep Learning-Based Detection for Multi-Mode OTFS with Index Modulation
Soo Young Shin and Adnan Tariq (Kumoh National Institute of Technology, Korea (South))

Technology, Korea (South)

- [O10-02] **LEEV: Load-Aware and Energy-Efficient VNF Deployment in NFV-Enabled Networks**
You-Chiun Wang (National Sun Yat-Sen University, Taiwan); Pei-Chin Tsai (National Sun Yat-sen University, Taiwan)
- [O10-03] **Deep Reinforcement Learning for Handover Optimization in 5G Networks**
Damianos Diasakos and Vasileios Kokkinos (University of Patras, Greece); Christos J Bouras (University of Patras - ELKE, Greece); Apostolos Gkamas (University of Ioannina, Greece); Philippos Pouyioutas (University of Nicosia, Cyprus)
- [O10-04] **Data-Driven Coverage and Capacity Optimization in Mobile Networks Using Bayesian Optimization**
Gonçalo Couto (ISCTE, Portugal); Joao Martins and Sameer Ibraimo (Multivision, Portugal); Gabriela Soares (Iscte, Portugal); Pedro Romano (ISCTE, Portugal); Pedro Sebastião (ISCTE-IUL, Portugal)
- [O10-05] **Adaptive PSO Algorithm for Cooperative Multi-UAV Path Planning in Disaster Relief**
Haris Muhammad and Haewoon Nam (Hanyang University, Korea (South))

011. AI and Its Applications 3

Chair: Prof. Jin-Woo Jung (Dongguk University, South Korea)

Room D, Time 10:50~12:30

- [O11-01] **From Synchronized Testbed to MaskForceNet: End-To-End Force Estimation for Neurovascular Guidewires**
Jae Eun Ko, Dae Hwan Ko, Man Jae Shin, Jiwon Pak, Ju Young Oh, Su Lim Kang, Ji Yean Kwon and Sung Min Kim (Dongguk University, Korea (South))
- [O11-02] **Toward 6G-Ready Uplink Resource Control: Standard-Aware RB Coordination and MADRL-Based Power Control**
Jung-Min Son, Joon-Young Park and Young-Chai Ko (Korea University, Korea (South))
- [O11-03] **SecReviewAgent: Context-Aware Security Review of Infrastructure-as-Code Using Persistent Architecture Memory**
Naga Krishna Reddy Muppidi, Veera Ravindra Divi and Sneha Gullapalli (USA); Rambabu Pasumarthy (GITAM Deemed to Be University, India)
- [O11-04] **A Hybrid Attention Network with Cumulative Source Aggregation for Single Image Super-Resolution**
Dong-Hyun Kim, In-Uk Joung, Dong-Myung Kim and Jae-Won Suh (Chungbuk National University, Korea (South))
- [O11-05] **Predictive Maintenance for a Hydraulic System on a Vehicle Using LSTM-Based Autoencoder**
Billel Hakem (KNDS France & Conservatoire National Des Arts et Métiers, ECE PARIS, France); Jae Yun Jun Kim (ECE Paris, France); Samia Bouzeffrane (CNAM, France); Philippe Millet (Nexter Systems, France)

012. Services, Applications, and Emerging Topics 1

Chair: Dr. Esmot Ara Tuli (University of Southern Denmark, Denmark)

Room A, Time 15:20~17:00

- [O12-01] **Schedulability Analysis of Global EDF, RM, and DM on Multicore FreeRTOS Kernel**
Chaeun Lee, Seong Hyeon Lim, Young Soo Do, Sung Bhin Oh, Young Min Kim, Beom Gi Suh and Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [O12-02] **AI-Agent Framework for Sales Risk Identification and Objection Handling Support in Live Commerce**
Jiho Kim, Sangmin Park and Yooshin Kwon (Chung-Ang University, Korea (South)); Heongi Kim and Hyeonjae Cheon (GS Retail Co. Ltd, Korea (South))
- [O12-03] **Adaptive Traffic-Aware Load Balancing Mechanism in Data Center Networks Using P4 Switches**
Hsueh-Wen Tseng (National Chung-Hsing University, Taiwan); Ruei-Yu Wu (National Taiwan University of Science and Technology, Taiwan); Yu-Cheng Chang (National Chung Hsing University, Taiwan)
- [O12-04] **Asynchronous Pulse Code Multiple Access Toward Underwater Massive IoT Using VLF Electromagnetic Waves**
Iruru Ouchi and Mayu Selena Horiuchi (Tokyo University of Science, Japan); Ferdinand Peper (National Institute of Information and Communications Technology, Japan); Kenji Leibnitz (NICT, Japan); Naoki Wakamiya (Osaka University, Japan); Kiyoshi Egawa (Kyowa Electronic Instruments, Japan); Maki Arai (Shibaura Institute of Technology, Japan); Jin Nakazato and Mikio Hasegawa (Tokyo University of Science, Japan)
- [O12-05] **A Survey on Caching Systems in Serverless Computing**
Donghyeon Kim and Sangoh Park (Chung-Ang University, Korea (South))
- [O12-06] **A Survey on Optimization Techniques for on-Device Large Language Model Inference**
Mingyu Jo and Sangoh Park (Chung-Ang University, Korea (South))

013. Communications and Networks for B5G and 6G 6

Chair: Prof. Jing Wang (University of South Florida, USA)

Room B, Time 15:20~17:00

- [O13-01] **Congestion-Aware Mobility Robustness Optimization: A Multi-Vendor Approach in Live Networks**
Tiago Faria (ISCTE - Instituto Universitário de Lisboa, Portugal); Joao Martins and Sameer Ibraimo (Multivision, Portugal); Gabriela Soares (Iscte, Portugal); Nuno Souto (ISCTE, Portugal); Pedro Sebastião (ISCTE-IUL, Portugal)
- [O13-02] **Low-Overhead User Scheduling for IRS-Assisted Uplink NOMA Exploiting Dumb Antennas**
Min Jae Jang, Junsu Kim and Su Min Kim (Tech University of Korea, Korea (South))

- [013-03] **Graph-Based Optimization of Physical Cell Identifiers and Root Sequence Indexes in 4G/5G Networks**
Pedro Trogeira Cruz (ISCTE - Instituto Universitário de Lisboa, Portugal); Ricardo Costa, Sameer Ibraimo and Joao Martins (Multivision, Portugal); Américo Correia (ISCTE, Portugal); Pedro Sebastião (ISCTE-IUL, Portugal)
- [013-04] **Characterizing Bottleneck Shifts in Semantic Communication Under Channel Variations and Device Heterogeneity**
Hideharu Sakata (Kyushu Institute of Technology, Japan); Yuzo Taenaka (Nara Institute of Science and Technology, Japan); Kazuya Tsukamoto (Kyushu Institute of Technology, Japan)
- [013-05] **Coverage Enhancement in Disaster Communication Networks via Active RIS-Assisted UAV Deployment**
Yong-Jin Song and Juyeong Baek (Ajou University, Korea (South)); Hyung-sub Kim and Jeehyeon Na (ETRI, Korea (South)); Jung Mo Moon (Electronics and Telecommunications Research Institute, Korea (South)); Minsoo Jeong (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Howon Lee and Bang Chul Jung (Ajou University, Korea (South))

014. Communications and Networks for B5G and 6G 7

Chair: Prof. Osamu Takyu (Shinshu University, Japan)

Room C, Time 15:20~17:00

- [014-01] **Evaluating the Effectiveness of PLIM Mapping Design Using past Monthly Data**
Atsuhiko Tokita and Osamu Takyu (Shinshu University, Japan); Koichi Adachi (Keio University, Japan); Mai Ohta (Kogakuin University, Japan); Takeo Fujii (The University of Electro-Communications, Japan)
- [014-02] **Guaranteed Interference and Minimum-Allocation Constraints with Throughput Maximization for Local 5G Scheduling via ILP**
Haruka Sakamoto and Osamu Takyu (Shinshu University, Japan); Kohei Akimoto (Akita Prefectural University, Japan)
- [014-03] **A Fast and Accurate Two-Stage Sketch Framework for Heavy Hitter Detection**
Shang-Chen Li, Yeim-Kuan Chang and Shih-Hsuan Liu (National Cheng Kung University, Taiwan)
- [014-04] **Efficient TCAM like Prefix Design and the Implementation Using Various Types of Memory on FPGA for Multi-Dimensional Packet Classification**
Pin-Hsun Chiu, Yeim-Kuan Chang and Shih-Hsuan Liu (National Cheng Kung University, Taiwan)
- [014-05] **Fast and Scalable Dynamic Spectrum Allocation Using a Coherent Ising Machine**
Manato Hosokawa and Jin Nakazato (Tokyo University of Science, Japan); Maki Arai (Shibaura Institute of Technology, Japan); Takesue Hiroki (NTT Corporation, Japan); Kazuyuki Aihara (The University of Tokyo, Japan); Mikio Hasegawa (Tokyo University of Science, Japan)

015. AI and Its Applications 4

Chair: Prof. Dong Seong Kim (Kumoh National Institute of Technology, South Korea)

Room D, Time 15:20~17:00

- [015-01] **Comparing Structure-to-Property Models Under Shared MatBench Protocol**
Euseong Kim, Junhee Seok and Youngseo Hwang (Korea University, Korea (South))
- [015-02] **GATv2+LP: GATv2-Based WSS Topology Design with Link Pruner for Datacenter Network**
Takashi Miyamura (Senshu University, Japan)
- [015-03] **Low-Invasive Parameters-Based Machine Learning Models with XAI for Chronic Endometritis Prediction**
Vincent Peter C Magboo, Ma Sheila A Magboo, Christian Jesse O. Bonifacio, Ma. Estela Leonila H. Malunes and Alexine Johnieco D. Salazar (University of the Philippines Manila, Philippines)
- [015-04] **Grid-Aware Lightweight Machine Learning for Maneuver Prediction at Intersections Toward Proactive V2N Handover in 5G/B5G Networks**
Heriansyah Heriansyah (Johannes Kepler University of Linz, Austria & Institut Teknologi Sumatera, Indonesia); Gabriele Kotsis (Johannes Kepler University Linz, Austria)
- [015-05] **Retrieval-Augmented Department Routing of Civil Complaints Using a Work-Item Knowledge Base**
JongHeon Baek, Doyeop Kim, Dahee Lee, In-nea Wang, Kang-Woo Lee and Junho Jeong (Dongguk University, Korea (South))

July 10, 2026 (Friday)

016. Services, Applications, and Emerging Topics 2

Chair: Prof. Eisuke Kudoh (Tohoku Institute of Technology, Japan)

Room A, Time 09:00~10:40

- [016-01] **Indoor Positioning Using Multiple Sensing Data with Likelihood-Based Fusion of Top Two Sensor Candidates**
Miku Kosugo and Eisuke Kudoh (Tohoku Institute of Technology, Japan)
- [016-02] **Efficient Digital Twin Construction in Vehicular Networks via Distance-Based NOMA Pairing**
Shih-Fan Chou, Ying Chen, You-Sen Chang and Yu-Chen Kuo (National Taiwan University of Science and Technology, Taiwan)
- [016-03] **Hybrid Network-Side Geolocation for MDT Using Timing Advance and WkNN**
Alexandre Rodrigues (ISCTE-IUL, Portugal); Joao Martins and Sameer Ibraimo (Multivision, Portugal); André Glória, Gabriela Soares and Pedro Sebastião (ISCTE-IUL, Portugal)
- [016-04] **PLCA-Aware One-to-Many Diagnostic Transport over 10BASE-T1S Edge Networks**

Minsoo GU, Young Soo Do, Beom Gi Suh, Young Min Kim, Jae Hun Kang and Jae Wook Jeon (Sungkyunkwan University, Korea (South))

[016-05] TSN Scheduling for Deterministic Control over 10BASE-T1S in Zonal Automotive Architectures

Jae Hun Kang, Young Soo Do, Chan Gyu Park, Sung Bhin Oh, Dong min Seok, Beom Gi Suh, Minsoo GU and Jae Wook Jeon (Sungkyunkwan University, Korea (South))

017. Communications and Networks for B5G and 6G 8

Chair: Prof. Kohei Ohno (Meiji University, Japan)

Room B, Time 09:00~10:40

[017-01] Energy-Saving Method for Bluetooth Low Energy Beaconing Using Tug-of-War Dynamics

Reona Nomura (Tokyo University of Science, Japan); Song-Ju Kim (SOBIN Institute LLC, Japan); Ryosuke Isogai (Seiko Future Creation Inc., Japan & National Institute of Information and Communications Technology, Japan); Yoshifumi Yoshida (Seiko Future Creation Inc, Japan); Hiroyuki Yasuda (The University of Tokyo, Japan); Maki Arai (Shibaura Institute of Technology, Japan); Jin Nakazato and Mikio Hasegawa (Tokyo University of Science, Japan)

[017-02] Toward Low-Overhead and Reliable Available Bandwidth Estimation for Adaptive Link Selection in Vehicular Environments

Kakeru Tanida, Daiki Nobayashi, Takeshi Ikenaga and Kazuya Tsukamoto (Kyushu Institute of Technology, Japan); Kazuya Okada (Toyota Motor Corporation, Aichi, Japan)

[017-03] Reinforcement Learning Based Sensitivity Control for Spatial Reuse in IEEE 802.11ax WLANs

Kuei-Ping Shih, Yi-Ting Lin and En-Hsiang Chou (Tamkang University, Taiwan); San-Yuan Wang (I-Shou University, Taiwan)

[017-04] Location-Assisted Random Access for Static IoT in LEO Satellite Networks

Taecheon Kim (Hanbat National University, Korea (South)); Kyungmin Park (Electronics and Telecommunications Institute, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South)); Inkyu Bang (Hanbat National University, Korea (South))

[017-05] Enhanced Contention-Based Random Access for 5G NR and Beyond: Supporting NES

Jisoo Park (Electronics and Telecommunications Research Institute, Korea (South)); Jaemin Ahn (Chungnam National University, Korea (South)); JunHwan Lee (Electronics and Telecommunications Research Institute, Korea (South))

018. AI and Its Applications 5

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

Room C, Time 09:00~10:40

[018-01] A Lightweight Python-Based Framework for Detecting False Information Attacks in Vehicular Ad Hoc Networks Using Isolation Forest

Hassan Mistareehi (Murray State University, USA); Shafika Moni (Embry Riddle Aeronautical University, USA); Abdelatif H. Aboualy and Jason Owen (Murray State University, USA)

[018-02] Evaluation of Neural Network Architectures for Intrusion Detection in Resource-Constrained Embedded Network Systems

Hassan Mistareehi, Rizwan Syed, Ezana Fekadu and Zheng Zhang (Murray State University, USA); Abdulrahman Yerali (MSU, USA); Md Sultan Al Nahian (Pennsylvania State University, Harrisburg, USA)

[018-03] HybridFraudNet: A Dual-Branch CNN-GNN Architecture for Healthcare Insurance Fraud Detection

Subhash Tatavarthi (Kasmo, USA); Venkatasatayaravikiran Bikkavolu, Sneha Gullapalli, Raghunath Reddy Koilakonda and Veera Ravindra Divi (USA)

[018-04] Autocorrelation-Based Window Size Selection for Multivariate IoT Time-Series

Nahye Ki, Dongje Yang and Su Sik Bang (Tech University of Korea, Korea (South))

[018-05] LiDAR-Supervised Monocular Depth Estimation via Cross-Modal Supervision

HyeHyeon Park (Sungkyunkwan University & Automation Lab, Korea (South)); Young Hoon Suh, Sun Hong Jung and Jae Wook Jeon (Sungkyunkwan University, Korea (South))

019. Services, Applications, and Emerging Topics 3

Chair: Prof. Seokjoo Shin (Chosun University, South Korea)

Room A, Time 10:50~12:30

[019-01] Analysis of Runtime Client-Join Disturbance in a Micro XRCE-DDS Client-Agent Architecture

Sang Joon Shin, Sung Bhin Oh, Young Soo Do, Beom Gi Suh, Seung Uk Son, Chan Gyu Park, Young Min Kim and Jae Wook Jeon (Sungkyunkwan University, Korea (South))

[019-02] Impact of Service Disciplines on Performance of Wireless Powered Sensor Networks

Mingfu Li, Tzu-Feng Wang, Yen-Chen Yeh and Fang-Shuo Chang (Chang Gung University, Taiwan)

[019-03] An Improved Human Detection Scheme Using UWB Impulse Response and Grayscale Image Classification

Rion Hirata and Kohei Ohno (Meiji University, Japan)

[019-04] An Efficient Image Dehazing Algorithm Using Wavelength-Based Transmission Rate Estimation for Edge Applications

Yu-Hsuan Lee (Multimedia Circuit and System Lab, Department of Electrical Engineering, Yuan-Ze University, Taiwan); Yen-Chi Huang (Yuan Ze University, Taiwan)

[019-05] Soft Decision-Based Adaptive Weighted Focus Measure for Multi-Focus Image Fusion

Hoon-Seok Jang (Korea Electronics Technology Institute, Korea (South)); Junsu Park (Kunsan National University, Korea (South));

Choi Ju-Hwan (Korea Electronics Technology Institute, Korea (South))

020. Communications and Networks for B5G and 6G 9

Chair: Prof. Seong Ho Chae, (Tech University of Korea, South Korea)

Room B, Time 10:50~12:30

- [020-01] Adaptive Image Transmission Control Based on Wireless Communication Quality for Wide-Area Monitoring with Autonomous Mobile Robots
Masaki Haruta, Daiki Nobayashi, Kazuya Tsukamoto and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)
- [020-02] Flow Fairness Control Using AI-Based Congestion Control Algorithm Estimation on Programmable Data Plane Network
Yuya Kotoku, Daiki Nobayashi and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)
- [020-03] Distributed Uplink Transmission Control for Collision Avoidance in LoRa-Based LEO Satellite Communications
Kouta Tamura, Nova Khamsah, Daiki Nobayashi, Kazuya Tsukamoto and Takeshi Ikenaga (Kyushu Institute of Technology, Japan); Goshi Sato (NICT, Japan); Kenichi Takizawa (National Institute of Information and Communications Technology, Japan)
- [020-04] Data Encoding Based Transmission Control for Out of Area Leakage Suppression in Spatio-Temporal Data Retention System
Yuma Yoshioka, Daiki Nobayashi, Kazuya Tsukamoto and Takeshi Ikenaga (Kyushu Institute of Technology, Japan); Myung Lee (CUNY, City College, USA)
- [020-05] Shared Data Intelligence-Driven Multi-Task Prediction for Efficient Resource Utilization in 6G Networks
Kamrul Hasan and Seong Ho Jeong (Hankuk University of Foreign Studies, Korea (South))

021. Communications and Networks for B5G and 6G 10

Chair: Prof. Younghoon Park (Sookmyung Women's University, South Korea)

Room C, Time 10:50~12:30

- [021-01] Adaptive Encryption Control for Wireless-Congestion-Aware Medical IoT Communications
Kazutaka Kaneko (Kyushu Institute of Technology, Japan); Dirceu Cavendish (UCLA/Kyushu Institute of Technology, USA); Daiki Nobayashi and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)
- [021-02] Programmable Data Plane-Based TCP Multi-Queue Scheduling Scheme Using RTT and CCA Classification
Ryota Murakami, Daiki Nobayashi and Takeshi Ikenaga (Kyushu Institute of Technology, Japan)
- [021-03] Traffic Steering Technology Using Multiple Non-3GPP Access Lines Based on the 3GPP Standards in the Internet

of Vehicles

Taichi Hayashi, Daiki Nobayashi, Kazuya Tsukamoto and Takeshi Ikenaga (Kyushu Institute of Technology, Japan); Naoya Kaneko (Toyota Motor Corporation, Japan & Tokyo University of Agriculture and Technology, Japan); Koji Takeoka (Toyota Motor Corporation, Japan)

- [021-04] Performance Analysis of FSF-LoRa Under Overlapping Transmissions: From Link-Level Interference to System-Level Throughput
Ryoya Saito (University of Electro-Communications, Japan); Koichi Adachi (Keio University, Japan)
- [021-05] Enhancing Data Dissemination in RSSI-Based Spatio-Temporal Data Retention Systems Using Information Centric Networking
Tomoki Suda, Daiki Nobayashi, Takeshi Ikenaga and Kazuya Tsukamoto (Kyushu Institute of Technology, Japan); Makoto Misumi and Ryo Nakamura (Fukuoka University, Japan)

July 08, 2026 (Wednesday)

Poster P1

Chair: Prof. Yeon Ho Chung (Pukyong National University, South Korea)

Poster Hall, Time 15:20~17:00

- [P1-01] **A Study on Enhancing the Quantitative Evaluation Framework for Assessing Cyber Incident Response Capabilities in Nuclear Facilities**
Dongjun Choi, Ju Hyeon Lee and Jung Taek Seo (Gachon University, Korea (South))
- [P1-02] **Vector Vortex Beam Steering in OAM-Multiplexed Quantum Optical Wireless Communication Systems**
Fayshal Ahmed and Yeon Ho Chung (Pukyong National University, Korea (South))
- [P1-03] **Implementation of Resource-Efficient QAM Modulator with Decoupled Gain Scaling for 5G NR Systems**
Youngil Jeon (Electronics and Telecommunications Research Institute, Korea (South)); Hyungsik Ju (ETRI, Korea (South)); JunHwan Lee (Electronics and Telecommunications Research Institute, Korea (South))
- [P1-04] **Automotive Ethernet Physical Layer Degradation Diagnosis Using Built-in PHY Diagnostics: Experimental Proof-of-Concept**
Sung Bhin Oh, Young Soo Do, Seong Hyeon Lim, Beom Gi Suh and Young Min Kim (Sungkyunkwan University, Korea (South)); Sang Uk Han, Hyeon Keun Hong and Jong Joo Kang (Hyundai Mobis, Korea (South)); Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [P1-05] **Pilot-Aided Diffusion Model-Based Channel Estimation for OFDM-MIMO Systems**
Doyeong Kim (Tech University of Korea, Korea (South)); Yujae Song (Yeungnam University, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South))
- [P1-06] **CDC-Optimized Integrity Verification Architecture for 10 Gbps High-Speed Serial Links**
Joomyung Jung, Hyeonrae Kim and Oh Hyuk Jun (Kwangju University, Korea (South))
- [P1-07] **Dual-Certificate Architecture for Secure IoT-to-Blockchain RWA Tokenization**
Aygun Salimova (Ajou University, Korea (South)); Ki-Hyung Kim (Ajou University, Korea (South) & AJ, Korea (South))
- [P1-08] **AdaFed: Adaptive Selective Aggregation for Heterogeneous Federated Learning in Autonomous Driving**
Sunjun Hwang and Hwang Dohyun (Yonsei University, Korea (South))
- [P1-09] **Optimizing Security and Efficiency in Edge-Cloud Collaborative Environments: A Service-Aware Privacy Protection Approach**
Jihwan Lee (Dream Security Co., Ltd., Korea (South)); Myoung Sun Oh (Dream Security Co., Ltd., Korea (South)); Minyoung Park and Geonyoung Lee (Dream Security Co., Ltd., Korea (South))
- [P1-10] **Latency in Real-Time 3D Volumetric Streaming: A Comprehensive Study**
Seungwoo Hong (Convergence Networking Research Team/ETRI, Korea (South)); HoSun Yoon (ETRI, Korea (South)); Seong Moon (Principal Researcher, Korea (South)); Inayat Ali (Electronics and Telecommunications Research Institute (ETRI), Korea (South))
- [P1-11] **ProtoConNet: Prototypical Meta Learning for Out-of-Distribution Detection in Radar Modulation with Supervised Contrastive Loss**
Juhyoung Sung (Korea Electronics Technology Institute (KETI), Korea (South)); Kyung-Won Park (Korea Electronics Technology Institute, Korea (South))
- [P1-12] **The Layer Transferability Profile: Mapping Feature Hierarchies in Pretrained Vision Models**
Sanghyuk R Choi, Chanho Gu, Seongrok Kim, Donghwan Hwang, Donghun Ryu, Chiyoung Kim, Seokhyun Kim and Minhyeok Lee (Chung-Ang University, Korea (South))
- [P1-13] **Adaptive Energy-Aware Machine Learning Framework for Fault Monitoring in Network-on-Chip Architectures**
Shaheerullah and Sung Won Kim (Yeungnam University, Korea (South))
- [P1-14] **Comparisons with Snapping Shrimp Noise Detection for UWA-OFDM Systems**
Bogeun Seo, Sanjin Park and Hojun Lee (Hoseo University, Korea (South))
- [P1-15] **PhysHD-Dehaze: Orthogonal and Uncertainty-Aware Dehazing for Challenging Environments**
Hira Khan and Sung Won Kim (Yeungnam University, Korea (South))
- [P1-16] **Study on Cybersecurity for LLM Systems**
Insoo Sohn (Dongguk University, Korea (South)); Juphil Cho (Kunsan National University, Korea (South))
- [P1-17] **PQMigrate: A Backward-Compatible Post-Quantum Migration Blueprint for Wallets and Light Clients**
Collins Izuchukwu Okafor, Love Allen Chijioke Ahakonye, Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))
- [P1-18] **LLM-Assisted Network Management for Digital Twin-Enabled 5G Systems**
YuKai Wang and Janghee Woo (Hanyang University, Korea (South)); Gyeong-June Hahm (Electronics and Telecommunications Research Institute, Korea (South)); Kyung-yul Cheon (ETRI/Electronics and Telecommunications Research Institute, Korea (South)); Hyecheon Kwon (Electronics Telecommunications Research Institute, Korea (South)); Seungkeun Park (Electronics and Telecommunications Research Institute/ETRI, Korea (South)); Sang-Woon Jeon (Hanyang University, Korea (South))
- [P1-19] **Enhancing Bitcoin Mining Using Quantum Search Space Expansion and Non-Unitary Operator**
Yeonsong Suh and Younghoon Park (Sookmyung Women's University, Korea (South))

- [P1-20] **Process-State-Aware Remote MEC GPU Sharing for Vision-Guided Collaborative Robotic Welding**
Woo-Sung Jung, Taehyun Yoon, Dongkoo Shon and Daeseung Yoo (Electronics and Telecommunications Research Institute, Korea (South))

July 09, 2026 (Thursday)

Poster P2

Chair: Prof. Eunkyung Kim (Hanbat National University, South Korea)

Poster Hall, Time 09:00–10:40

- [P2-01] **Weighted Knowledge Distillation with DisturbLabel for Robust Learning**
Doyoung Koh, Taehoon Kim, Sehun Lee and Namgi Kim (Kyonggi University, Korea (South))
- [P2-02] **SpikeGuard-LF: Conformal Spike-Lazy Forests for Wireless Sensor Network Intrusion Detection**
SooYoung Jang and Eunkyung Kim (Hanbat National University, Korea (South))
- [P2-03] **Topology-Aware Decision Transformer for End-to-End Entanglement Request Scheduling in Quantum Networks**
Yeong-Jun Seok, DeaGun Kang and Youn-Hee Han (Korea University of Technology and Education, Korea (South))
- [P2-04] **ZittoBATT-250: Synthetic Abuse Data for Safer Smart Battery Early Warning Systems**
Mohamed Abubakar Dini Rage (Network Systems Laboratory, Korea (South)); Sium Bin Noor, Judith Nkechinyere Njoku, Taesoo Jun, Dong Seong Kim and Jae Min Lee (Kumoh National Institute of Technology, Korea (South))
- [P2-05] **Multimodal Deep Learning-Based Anomaly Action Recognition in Multiple Physical Security Domains**
Dongchil Kim (Korea Electronics Technology Institute (KETI), Korea (South)); Chang Mo Yang (Korea Electronics Technology Institute, Korea (South))
- [P2-06] **Lightweight CNN Model Design Using Bayesian Optimization and Truncated Singular Value Decomposition for SNR Estimation**
Abdullah Al Mahbub (Chosun University, Korea (South)); Ijaz Ahmad (Korea University, Korea (South)); Seokjoo Shin (Chosun University, Korea (South))
- [P2-07] **Design of Nonlinear Chirp for Multi-Node Identification in Extremely Band-Limited Underwater Communications**
Haeseong Kwon and Bogeun Seo (Hoseo University, Korea (South)); Hyunjin Shin (STX Engine, Korea (South)); Hojun Lee (Hoseo University, Korea (South))
- [P2-08] **Carbon-Aware Traffic Steering for TN-NTN Scenario via Graph Attention Reinforcement Learning**
Junyoung Kim and Soyi Jung (Ajou University, Korea (South))
- [P2-09] **Middleware Topology Comparison for Automotive Zonal Architectures: Zenoh, DDS, and Zenoh-Bridged DDS**
Beom Gi Suh, Sung Bhin Oh, Young Soo Do, Seung Uk Son, Young Min Kim, Chaeun Lee, Chan Gyu Park and Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [P2-10] **Edge-AI Enabled Real-Time Multi-Camera Casualty Detection and Tracking for Military IoT**
Sium Bin Noor (Kumoh National Institute of Technology, Korea (South)); Mohamed Abubakar Dini (Network Systems Laboratory, Korea (South)); Jae Min Lee, Dong Seong Kim and Jung Hyeon Kim (Kumoh National Institute of Technology, Korea (South))
- [P2-11] **Federated Learning Assisted Slot Specific SB SPS Scheduling for Distributed CV2X Networks**
Muneeb Muhammad (Sang Ji University, Korea (South)); Kwangman Ko (Sangji University, Korea (South))
- [P2-12] **Evaluating AMP for Automotive Gateways**
Chan Gyu Park, Beom Gi Suh, Seong Hyeon Lim, Sung Bhin Oh, Young Soo Do, Young Min Kim, Chaeun Lee and Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [P2-13] **Hybrid Session-Based UEBA for AWS Environment**
Doo-Hwan Choi (Pusan National University, Korea (South)); Geonwoo Yoon (Pusan National University, Korea (South)); Jae-Seok Kim and Yoon-Ho Choi (Pusan National University, Korea (South))
- [P2-14] **Web Visualization Performance Optimization Techniques Using CityGML 3.0-Based Multi-LoD Generation and Hierarchical 3D Tiles Structures**
Sohyeon Park (SUNDOSOFT, Korea (South)); Sungho Cho (SUNDOSOFT, Korea (South)); Joohyuk Park, Dawoon Jeong, Eunseo You and Isu Kim (SUNDOSOFT, Korea (South))
- [P2-15] **A Scalable Distributed Data Pipeline and Network Architecture for High-Resolution Carbon Spatial Mapping**
Seungho Jo, Inho Choi, Mira Park and Taeyoung Jung (Sundosoftware, Korea (South))
- [P2-16] **Cooperative Swarm Drone Interception via Dual-Reward CTDE MARL in Airbase Defense**
Muhammad Zacky Asy'ari and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))
- [P2-17] **SMT: SBOM and Merkle Tree Based Integrity Verification for Serverless Environments**
Jieon Lee, Won-Bin Kim and Daehye Seo (Sangmyung University, Korea (South))
- [P2-18] **SLA-Aware Resource Allocation for V2X Network Slicing via SAC-Based O-RAN xApp**
Muhammad Ashar Tariq and Deepak Singh (Kyungpook National University, Korea (South)); Muhammad Saad Malik (Daegu Gyeongbuk Institute of Science and Technology, Korea (South)); Chaehyeon Kim, Dayun Jang and Dongkyun Kim (Kyungpook National University, Korea (South))

Poster P3

Chair: Prof. Eunkyung Kim (Hanbat National University, South Korea)

Poster Hall, Time 10:50~12:30

- [P3-01] Quantum-Resistant RLWE Based Authentication Scheme for Space-Air-Ground-Integrated Network
Seokmo Jung and Hyeongeun Lim (Kyungpook National University, Korea (South)); Chae Kim (Kyungpook University, Korea (South)); YoungHo Park (Kyungpook National University, Korea (South))
- [P3-02] Cryptanalysis and Countermeasures of "Lightweight and Anonymous Authentication Scheme for Medical Internet of Things Services"
Hyeongeun Lim, Seokmo Jung, Taehun Kim and YoungHo Park (Kyungpook National University, Korea (South))
- [P3-03] False Negative Minimization in Isolation Forest Using Distribution-Based Dynamic Contamination Adjustment
Haim Lee, Won-Bin Kim and Daehee Seo (Sangmyung University, Korea (South))
- [P3-04] An Embedded Real-Time System for Human Trajectory Prediction Using ROS 2
Jihong Jeong, JunWoo Nam, Han Geyol Lee and Jongtae Rhee (Dongguk University, Korea (South)); Pavel Stasa (VSB - Technical University of Ostrava, Czech Republic); Jin-Woo Jung (Dongguk University, Korea (South))
- [P3-05] Battery-Aware Scheduling for Multi-Receiver Laser Wireless Power Transfer in IoT Systems
Hee June Lee, Su Min Kim and Junsu Kim (Tech University of Korea, Korea (South))
- [P3-06] Efficient Foreground Reconstruction via Mask-Guided Adaptive Multi-View Stereo
Sung-Won Cho, Min Hee Jo and Jin-Woo Jung (Dongguk University, Korea (South))
- [P3-07] Diffusion Model-Based Network Traffic Synthesis for Private 5G Network
Noh-sam Park (Electronics and Telecommunications Research Institute, Korea (South)); Mi-Kyung Han and Jonghoon Lee (ETRI, Korea (South))
- [P3-08] Deep Learning-Based Parking Lot Tailgating Detection and Prevention System Using a Corner Sub-Camera
Minseok Choi and Jaejoon Kim (Daegu University, Korea (South))
- [P3-09] Teacher-Anchored Worst-Case Stability Distillation for Membership Privacy
Hyeon-Jin Jeong, Seok-Won Hong, Jae-Hwan Jeong and Seok-Hwan Choi (Yonsei University, Korea (South))
- [P3-10] A Study on an Edge AI-Based Disaster AX Platform Architecture for Climate-Related Disaster Response in Island Regions
NunSol Park (NIA (National Information Society Agency), Korea (South)); Donghee Kim (National Information Society Agency, Korea

(South)); JinKyu Yang (NIA, Korea (South)); Eunju Kim (National Information Society, Korea (South))

- [P3-11] Performance Analysis of the AOA Estimation Algorithm Based on Orthogonal Array
Tae-yun Kim and Suk-seung Hwang (Chosun University, Korea (South))
- [P3-12] Property-Aligned Conditional Material Generation in Diffusion Models via Auxiliary Prediction
Youngseo Hwang, Junhee Seok and Euseong Kim (Korea University, Korea (South))
- [P3-13] High-Speed Tiny Object Detection Using Synthetic Datasets on Resource-Constrained Hardware
DongHyuk Heo, JiChan Park, YeongUng Bae and SeungHee Lee (Hanwha Aerospace, Korea (South)); JongSue Bae (Hanwha Corporation R&D Center, Korea (South))
- [P3-14] Energy-Accuracy Balanced Indoor Positioning Using Tabular Q-Learning and Dynamic Kalman Filter
Hyeong Min Kim and Young-Bae Ko (Ajou University, Korea (South))
- [P3-15] Protection Distance Estimation for Coexistence of Mobile Communication and Fixed Microwave Systems in the 4.4-4.8 GHz Band
Ho Kyung Son (ETRI, Korea (South)); Hyunduk Kang (Electronics and Telecommunications Research Institute (ETRI), Korea (South))
- [P3-16] Maximum Likelihood Finite Memory Structure Filter Based Target Tracking Using Finite Nonlinear Measurements
Pyung Soo Kim (Tech University of Korea, Korea (South)); Joo-Sang Youn (Donggeui University, Korea (South))
- [P3-17] The Dual Steer Mobile System for Integrated TN and NTN in 6G
HyunKyung Yoo (Electronics and Telecommunications Research Institute, Korea (South)); Namseok Ko (ETRI, Korea (South)); Sung Hyuk Byun (Electronics and Telecommunications Research Institute, Korea (South))
- [P3-18] Simulation Validation of a Next-Generation Security Architecture for the Adaptive AutoSAR Platform Integrating an AI-Based Intrusion Detection System(AI-IDPS) and Hybrid Access Control(FA-RBAC)
Youngjin Kim (Telecommunications Technology Association, Korea (South))
- [P3-19] Domain-Adapted Language Models for Latent State Inference from Unstructured Text: A Comparative Study of Clinical Sepsis Prediction and Affective Processing
Seohyun Yoo, Yewon Kwon, Jaehong Kim, Yeonho Jo, Jaehyuk Cho (Jeonbuk National University, Korea (South))

Poster P4

Chair: Prof. Jung Hoon Lee (Hankuk University of Foreign Studies, South Korea)

Poster Hall, Time 15:20~17:00

- [P4-01] **Score-Based Generative Model for Wireless Channel Estimation**
Seungcheol Oh and Joongheon Kim (Korea University, Korea (South))
- [P4-02] **LASA: Latency-Aware Safety Arbitration for Vision-Language-Action Autonomous Driving**
Young Hoon Suh and Hyo Jin Park (Sungkyunkwan University, Korea (South)); HyeHyeon Park (Sungkyunkwan University & Automation Lab, Korea (South)); HyeJun Hong (SungKyunKwan University, Korea (South)); Seung Yun Noh, Sun Hong Jung and Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [P4-03] **A Three-Plane Agentic AI Architecture for Patient-Centered Multimodal Maternal Health Monitoring**
Ahnna Lee (Yonsei University, Korea (South) & Yonsei University College of Medicine, Korea (South)); Hyan Kwon, Suhra Kim, Jung Heui Kim, Seng Chan You and Ja-Young Kwon (Yonsei University College of Medicine, Korea (South))
- [P4-04] **Dimension-Selected Orthogonal Particle Swarm Optimization for High-Dimensional Problems**
Zhi Xing, Huan Zhang and Hu Jin (Hanyang University, Korea (South))
- [P4-05] **A Study on RS-Assisted RAIDRR for Metadata-Aware Memory Reliability in Future Network Infrastructure**
Taeuk Ha and Sang-Hyo Kim (Sungkyunkwan University, Korea (South))
- [P4-06] **An ISAC-Inspired Medium Access Control Protocol for Propagation-Aware Underwater Sensor Networks**
Ho-Shin Cho and Tae Jin Kwon (Kyungpook National University, Korea (South))
- [P4-07] **Design of an on-Device AI-Based Autonomous Manufacturing System for Machining Processes**
Mahn-suk Yoon (Gumi Electronics & Information Technology Research Institute, Korea (South) & 구미전자정보기술원, Korea (South)); Sunghun Lee (GERI, Korea (South))
- [P4-08] **Real Time Food Vision Inspection on Raspberry Pi 5 and Jetson Orin Nano with Throughput Comparison**
Taehun Kang, Yunsang Cho, YongSeok Cho and Ju-Hyuck Han (Konyang University, Korea (South))
- [P4-09] **CNN-Based Detection of Nonstationary Micro-Doppler Sidebands Under Cluttered Slow-Time Dynamics**
Zahra Zarei and Chung G. Kang (Korea University, Korea (South))
- [P4-10] **Heading-Aware Multi-Agent Exploration for Human Search via Merged-Map Coordination**
Muhammad Imad and Soo Young Shin (Kumoh National Institute of Technology, Korea (South))
- [P4-11] **Applying ML-DSA's NTT to SMAUG-T Polynomial**

Multiplication: Feasibility Analysis and Performance Comparison

Kim Ye Jin, Kim Dong Hyeon and Dong-Chan Kim (Kookmin University, Korea (South))

- [P4-12] **The Council of Experts: A Heterogeneous Rational-Aware Framework for Robust Energy Forecasting**
Ali Aouto (ICT Convergence Research Center, Kumoh National Institute of Technology, Korea (South)); Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))
- [P4-13] **Failure-Aware Adaptive Recovery Policy for Vehicle OTA Updates**
Young Min Kim, Sung Bhin Oh, Young Soo Do, Beom Gi Suh, Chaeun Lee, Seung Uk Son, Chan Gyu Park and Jae Wook Jeon (Sungkyunkwan University, Korea (South))
- [P4-14] **Multi-Input Model for TENS Stimulation Intensity Classification and Prediction Using ECG, EMG and Personal Characteristics**
SeungHui Kim, Sunghun Lee and Daechang Kim (Dongguk University, Korea (South)); SungMin Kim (Dongguk University-Seoul, Korea (South))
- [P4-15] **HG-Probe: A Safety-Bounded Evidence Layer for LLM-Guided Web/API Security Testing**
Jimin Yang (Gyeongbuk Software Meister High School, Korea (South))
- [P4-16] **Minke Whale Whistle Generation for Underwater Biomimetic Communication Using Flow Matching**
Minho Kim, Sanghwa Lee and SeungHwan Seol (Inha University, Korea (South)); Geun-Ho Park and Jongmin Ahn (Agency for Defense Development, Korea (South)); Jaehak Chung (Inha University, Korea (South))
- [P4-17] **Coordinated SLIPT and TDD Optimization for Energy-Deprived Seabed Sensors Using Meta-Learning Enabled ROV**
Yongtaek Woo (Yeungnam University, Korea (South) & Ai System Implementation Lab, Korea (South)); Sang-Woon Jeon (Hanyang University, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South)); Yujae Song (Yeungnam University, Korea (South))
- [P4-18] **Quantitative Privacy Evaluation and Lightweight Edge Blockchain-Based Application Architecture for Intelligent Home Environments**
Tai Yeon Ku and Wan-Ki Park (ETRI, Korea (South))
- [P4-19] **An Efficient and Theoretically-Completed Variant of CASCADE Error Correction Protocol for QKD**
Heejeung Won, Jieun Ryu and Ju-Sung Kang (Kookmin University, Korea (South)); Yongjin Yeom (Kookmin, Korea (South))
- [P4-20] **An Energy Influence Based Indoor Lighting Control Method to Maximize Natural Light Utilization**
SeungTaek Oh and JaeHyun Lim (Kongju National University, Korea (South))

Location

Aula Magna Carassa e Dadda, Building BL28
Politecnico di Milano, Bovisa Campus
Via Lambruschini 4, Building BL28
20156 Milan (MI), Italy



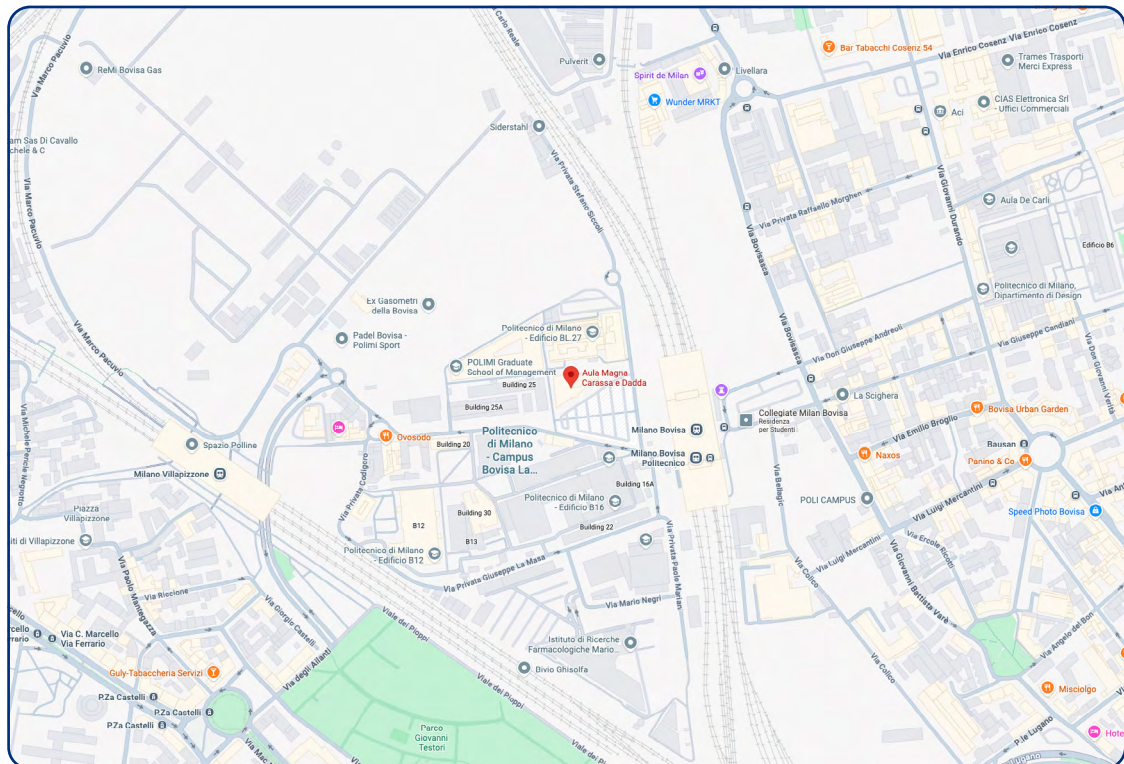
Introduction

ICUFN 2026 in Milan will be held at the Aula Magna Carassa e Dadda, located in Building BL28 on the Bovisa Campus of Politecnico di Milano, which will serve as the main conference venue. The conference banquet venue will be announced at a later date, with further details to be provided closer to the event.

Founded in 1863, Politecnico di Milano is widely recognized as one of Europe's leading universities in engineering, architecture, and industrial design. The Bovisa Campus is a key hub for innovation and applied research, hosting a wide range of departments and research centers focused on advanced technologies and interdisciplinary collaboration.

The campus offers a vibrant and dynamic academic environment, strengthened by close ties with industry and a diverse international community. With a large student body that includes a significant proportion of international students, the university promotes a global perspective alongside excellence in education and research.

Map



Banquet Hotel

Radisson Blu Hotel Milan

Introduction

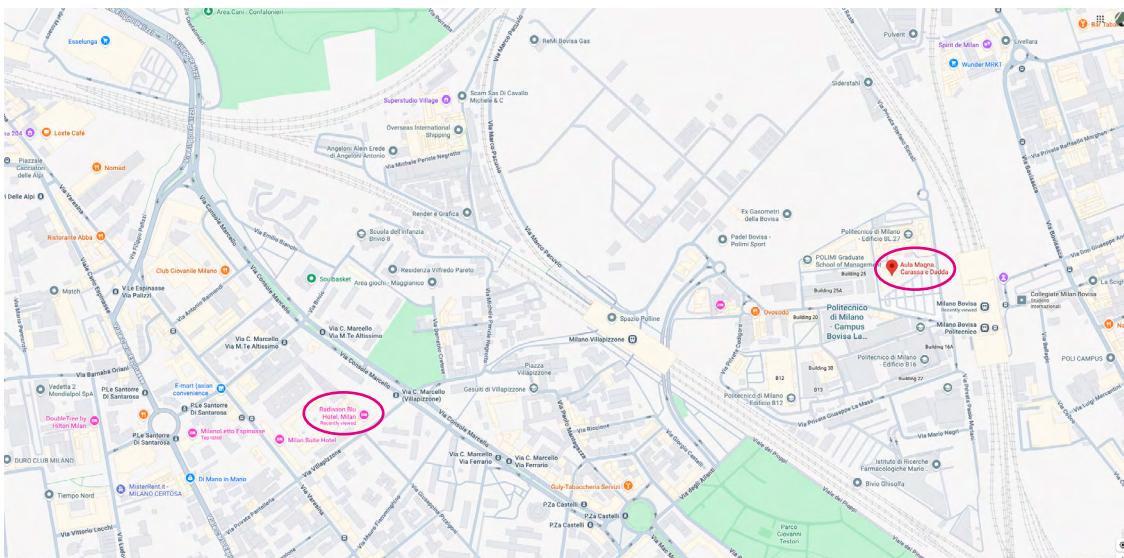
A stylish 4-star hotel featuring modern design, wellness facilities (pool, gym, sauna), and high-quality business amenities.

Distance to Venue

Approximately 15–20 minutes on foot (about 1.0–1.5 km depending on route) from Bovisa Campus

Homepage

<https://www.radissonhotels.com/en-us/hotels/radisson-blu-milan>



Centro Storico

This is the historic center of Milan, dominated by the breathtaking Duomo in Piazza del Duomo, the Royal Palace, and Merchant's Square - a lively medieval square with outdoor markets, exhibitions, and live music. The neighborhood is also home to Vittorio Emanuele II, the city's oldest and most glamorous shopping center. In short, Centro Storico is a great base if you want to be close to shopping, fine dining, cultural and historical sites of Milan.



Brera

Just north of the city center, a short walk from Sforza Castle, La Scala, and several interesting museums is Brera. This neighborhood is popular with writers, poets, and artists. It has a bohemian vibe, and cobbled streets flanked by traditional houses. They're peppered with trendy art galleries, cocktail bars, and old-style trattorias which delight with Milanese treats. Brera is the perfect neighborhood for a romantic couple's break in the city.



Milan Night Walking Tour

Explore the city after dark on an amazing Milan Night Walking Tour. This superb guided tour invites you to discover incredible examples of haunting Gothic architecture after the sun goes down. Local experts will mesmerize you with stories and ancient tales as you wander Milan's piazzas and side streets. Pass the iconic Duomo, Vittorio Emanuele II Gallery, and Sforza Castle - one of Europe's largest citadels. You'll take in La Scala - one of the world's most important opera houses. See the city's charming cobbled streets as they are illuminated by the glow of the moon.



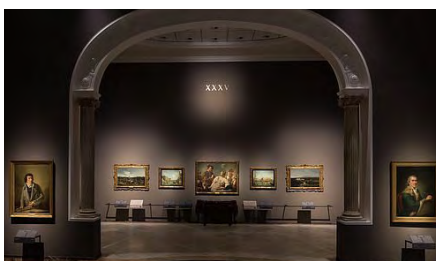
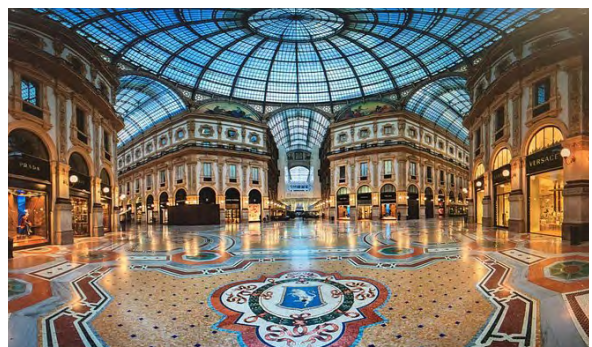
Duomo Di Milano

The centerpiece of Milan, the Duomo is one of Europe's greatest architectural and cultural landmarks. As Italy's largest church and one of the largest in the world, it took over 600 years to build. Today, the Duomo has a capacity of 40,000 people and is home to the world's second-largest organ. Admire the wide selection of religious art on display inside, or marvel at the 3000 statues that line its Gothic exterior. Be sure to join one of the available Duomo tours, which include art tours and even rooftop tours, where you might be able to see as far as the Italian Alps. – Tripadvisor



Galleria Vittorio Emanuele II

For sheer belle époque splendor, this extravagant 19th-century glass-topped, barrel-vaulted tunnel serves as a lively, noisy and colorful shopping mall, teeming with life and inviting you to people-watching from the tables that spill from the Galleria's many bars and restaurants.



Pinacoteca di Brera

See some of the world's most stunning, centuries-old paintings from Italian masters including Caravaggio and Raphael. The gallery's collection is housed in a 19th century former monastery.

Teatro Alla Scala

This world-renowned opera house was built in 1778, where many composers wrote and conducted works including such greats as Rossini, Puccini, Verdi and Toscanini.



I Navigli

Locals and travelers flock to this quaint neighborhood for its inviting atmosphere, delicious food, and great drinks. The Navigli area is centered on the two remaining canals that once encircled Milan. During the day, you can stroll along the waterfront to spot beautiful street art and visit historic landmarks like Vicolo dei Lavandai. Grab a spot by the Darsena pond at sunset to people-watch and relax before heading to a cozy bistro for dinner. Complete your visit with some gelato and drinks at the local pubs for a night out. The traditional Fiera di Sinigaglia flea market takes place here once a week too. – Tripadvisor



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Adaptive Energy-Aware Machine Learning Framework for Fault Monitoring in Network-on-Chip Architectures

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Abstract—Fault monitoring in mesh Network-on-Chip architectures carries a persistent energy overhead that scales poorly as network complexity grows. Always-on detection units consume fixed resources regardless of actual fault activity an inefficiency worth addressing in energy-constrained designs. This work examines whether a Deep Q-Network (DQN) agent can learn to adaptively control monitoring intensity on an 8×8 mesh NoC, dynamically switching between full, reduced, and off monitoring modes in response to real-time network conditions. The simulation employs FTXY fault-tolerant routing under bit-reversal traffic across 500 episodes, with the agent trained over the first 250 and evaluated on the remaining 250. Against a fixed full-monitoring baseline, the learned policy reduced monitoring energy from 0.0295 to 0.0106 a 64% reduction and cut total system energy by 59% (0.0318 to 0.0129). Packet delivery ratio improved marginally from 0.186 to 0.188, while fault detection accuracy decreased from 0.99 to 0.88, a trade-off the agent consistently accepted in exchange for sustained energy savings. These results indicate that reactive, policy-driven monitoring is a viable alternative to static approaches, particularly in systems where energy efficiency outweighs the need for near-perfect fault coverage.

Index Terms—Network-on-Chip (NoC), Fault Detection, Deep Q-Network (DQN), Reinforcement Learning, Energy Efficiency

I. INTRODUCTION

Fault detection in mesh Network-on-Chip architectures has long been treated as a binary commitment: either the monitoring hardware runs continuously at full sensitivity, or it does not run at all. As SoC designs scale toward higher core counts and tighter energy budgets, this all-or-nothing approach becomes increasingly difficult to justify. Always-on Fault Detection Units consume a fixed energy overhead at every simulation step, irrespective of actual fault activity in the network, which means the majority of monitoring cycles are spent watching a fabric that is functioning normally. At a fault injection rate as low as 3% per step, the cost of maintaining full detection sensitivity throughout is disproportionate to the threat level the network actually faces at any given moment. Existing fault-tolerant approaches have largely addressed this challenge at the routing layer, through adaptive path selection, fault-bypass mechanisms, or reconfigurable channel architectures, while

leaving the monitoring layer itself operating on a static, time-invariant policy. Reinforcement learning offers a different angle: rather than fixing the monitoring mode at design time, an agent can observe real-time network conditions and learn when full monitoring is genuinely warranted and when a reduced or suspended mode is sufficient. This work examines whether a Deep Q-Network can acquire such a policy reliably enough to deliver meaningful energy savings without unacceptable degradation in fault detection performance.

The FRoZN technique combines Q-learning with the ZMesh topology, modelling routing as a Markov Decision Process where each router continuously updates its Q-table based on link health, buffer occupancy, and traversal success [1]. Experiments across 5×5 to 15×15 networks demonstrate near-perfect delivery under 50% fault injection, outperforming baseline algorithms by over 10 percentage points beyond the 40% failure threshold, with performance tied directly to ZMesh’s diagonal bypass connectivity.

RL-FTR pursues a generalised reinforcement learning framework for conventional mesh NoCs, introducing a decentralised multi-agent architecture where each router learns independently using a two-level Q-table structure that halves memory requirements compared to monolithic implementations [2]. The reward function penalises congested or faulty links while rewarding low-latency deliveries, allowing routers to internalise failure patterns organically. Convergence speed remains sensitive to network size, and purely local policies occasionally produce suboptimal regional routing patterns.

The Mesh-of-Tree reconfiguration methodology embeds fault tolerance through minimalist structural modifications at leaf routers, incurring only 2.27% area overhead in 4×4 networks and 8.02% in 16×16 configurations [3]. Once configured, it guarantees bounded latency and zero packet loss for single faults without runtime overhead, making it well-suited for hard real-time systems. However, it handles only leaf-level failures, lacks congestion awareness, and cannot adapt to faults deeper in the tree hierarchy.

Efficient Dynamic Adaptive Routing (EDAR) is a fault tolerant NoC strategy that makes routing decisions using real

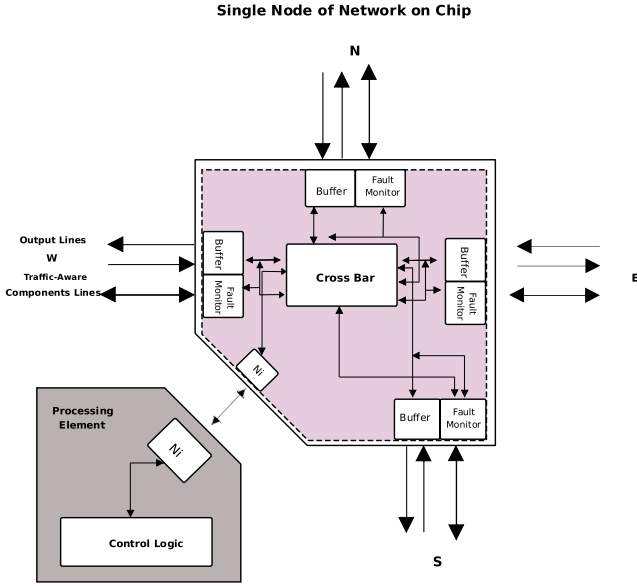


Fig. 1. Router structure with Cross bar and MM Module

time link conditions. Instead of fixed rules, EDAR assigns weighted penalties to busy, congested, and faulty channels, allowing the router to bypass unreliable paths while preserving throughput under adverse conditions. Using monitor modules, EDAR continually evaluates link status and selects the port with the minimum weight as the preferred forwarding direction, enabling graceful detours around failure hotspots.

Fig. 1 depicts a single EDAR node, where the processing element (PE) is linked to the network via a NI (network interface) and all routing logic is collapsed into a Cross Bar block that embodies both the adaptable arbitration policy and the adaptable routing scheme, while the three Buffer boxes represent the FIFO queues together with the monitor modules that continuously sense each outbound channel; each monitor evaluates three status flags Busy (B), Congested (C) and Faulty (F) based on buffer occupancy and on-line fault tests and forwards these flags to the CrossBar, which then computes a weight for every possible output direction (N,S,E,W) using the EDAR rule.

$$W_{\text{port}} = W_{\text{priority}} + \alpha_B B + \alpha_C C + \alpha_F F, \quad (1)$$

where W_{priority} encodes the minimal turn routing preference and $\alpha_B, \alpha_C, \alpha_F$ are fixed penalty coefficients. The Cross Bar selects the port with the smallest W_{port} , configures the internal switch fabric, and forwards the flit from the appropriate buffer to the chosen direction; if the destination coordinates match the current node, the packet is routed locally to the Processing Element (PE).

In the proposed work firstly, a Deep Q-Network agent is trained to dynamically control the Fault Detection Unit on an 8×8 mesh NoC, selecting between full, reduced, and off monitoring modes at each simulation step based on real-

time network conditions, replacing the conventional always-on approach that consumes fixed energy regardless of fault activity.

Secondly, the framework integrates FTXY fault-tolerant routing under bit-reversal traffic across 500 simulation episodes, incorporating a probabilistic fault model that injects stuck, link, and transient thermal faults with per-step recovery, enabling evaluation under conditions that closely reflect realistic NoC behaviour.

Thirdly, the DQN agent is optimised to balance fault detection accuracy, packet delivery ratio, and monitoring energy simultaneously, learning a policy that achieves a 64% reduction in monitoring energy and a 59% reduction in total system energy compared to the legacy full-monitoring baseline, while marginally improving packet delivery ratio from 0.186 to 0.188, demonstrating that intelligent adaptive monitoring can deliver substantial energy savings at a controlled and acceptable cost to detection accuracy.

II. RELATED WORK

Existing fault-tolerant routing work spans deterministic, reconfiguration-based, and learning-based approaches, each leaving gaps in scalability, congestion awareness, and integrated fault detection. Jagadheesh et al. propose RL-FTR, a multi-agent Q-learning algorithm for mesh NoCs using a two-level Q-table to handle link and router faults, validated in SystemC simulation and on FPGA [1]. While RL-FTR improves packet delivery and demonstrates hardware feasibility, it incurs non-trivial storage overhead and only implicitly addresses congestion under synthetic traffic conditions.

Samala et al. present an earlier RL-based fault tolerant routing for mesh NoCs using Q learning to find optimal routes in the presence of link and router faults, showing up to 19% more packets delivered than dynamic XY-YX routing across 5×5 , 15×15 meshes [2]. However, this work uses a flat Q table, no hardware implementation, and a limited fault model, making scalability and practical deployment challenging; our technique can build on their RL formulation while improving Q table efficiency and providing hardware aware design.

Choudhary et al.'s FRoZN targets ZMesh, combining mesh and zigzag links, and applies Q learning to dynamically route around link and router faults; simulations on 5×5 , 10×10 , and 15×15 ZMesh show near perfect delivery up to 50% faults and over 10% improvement beyond 40% faults versus a deterministic baseline [3]. FRoZN, however, is evaluated only in software, does not deeply analyze power/area, and is tightly coupled to ZMesh; our technique can generalize RL based fault tolerance to broader topologies and include implementation level metrics.

Nain et al. introduce NAFTR, an enhancement of EDAR using modified EMBRACE routers with AND/OR congestion logic, regional destination partitioning, and alternate port selection to avoid livelock and bypass faulty links in 2D meshes [4]. NAFTR achieves up to 18% higher flit delivery and lower latency and power than EDAR and FTXY, but relies on one-hop congestion information and fixed heuristic weights rather

than learned policies, limiting robustness under complex fault patterns.

Shah et al. propose a fault-tolerant routing method for MoT topologies, inserting 2:1 multiplexers between leaf routers and cores to locally reroute packets through adjacent healthy nodes when a leaf fails [5]. While this reduces packet loss in 4×4 and 16×16 configurations, it covers only permanent leaf faults, ignores congestion, and introduces additional area and delay overhead.

Liu et al. propose EDAR to bridge the gap between congestion-aware routing methods that fail under faults and fault-tolerant schemes that ignore congestion [6]. EDAR integrates a weight-based decision mechanism into the EM-BRACE router architecture, where Monitor Modules classify each outgoing channel as Busy, Congested, or Faulty, allowing the router to select the minimum-weight port combining directional preference with real-time status. This dual awareness yields significantly lower throughput degradation across 5–20% fault rates compared to specialised fault-tolerant benchmarks, at a hardware overhead of 0.241 μm^2 . However, EDAR relies on one-hop traffic information and fixed empirically tuned weights, preventing it from exploiting deeper congestion patterns or adapting to complex fault distributions.

Wang and Louri [7] propose CURE, a deep reinforcement learning-based NoC design framework that simultaneously addresses latency, energy efficiency, and reliability on an 8×8 mesh topology. CURE introduces reversible multi-function adaptive channels, a fault-tolerant router microarchitecture, and ten discrete operation modes managed by a per-router DRL control policy, achieving a 39% reduction in end-to-end latency, 92% improvement in energy efficiency, and a 7.7× increase in mean-time-to-failure over a static SECED baseline. CURE reconfigures hardware-level routing and error correction in mesh NoCs, whereas this work applies DQN-based dynamic control of Fault Detection Unit operational intensity to reduce monitoring energy overhead without hardware modification.

III. PROPOSED METHOD

A. System Model and Baseline Routing Engine

The models consists of 8×8 mesh Network-on-Chip comprising 64 routers as shown in Fig. 2, each maintaining a packet buffer of capacity eight and operating under a per-step injection rate of 0.005. Bit-reversal traffic governs the destination mapping, where each source node transmits to the bitwise reversal of its 6-bit identifier. Routing is handled by the FTXY algorithm, which follows standard XY dimension-ordered routing under fault-free conditions but reroutes packets around failed nodes using a Manhattan-distance heuristic when blocked. A probabilistic fault model injects stuck-node, link, and transient thermal faults at each simulation step with a rate of 0.03, and each fault type recovers independently according to per-type recovery probabilities applied at the start of every subsequent step.

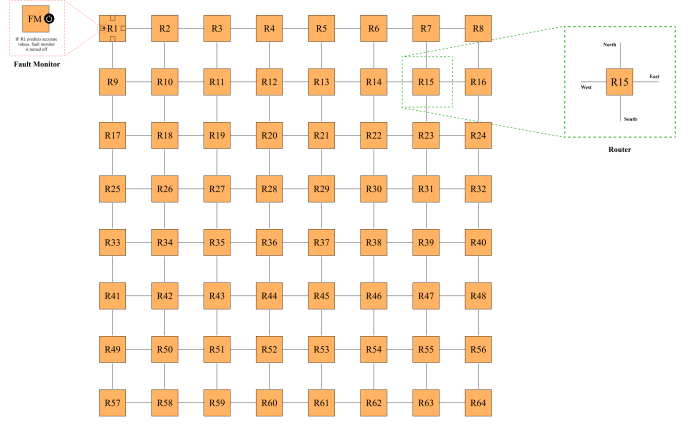


Fig. 2. Fault Monitor Switch

B. Reinforcement Learning Augmentation

A Deep Q-Network agent controls the operating mode of the Fault Detection Unit at every simulation step. The agent observes a 10-dimensional state vector encoding normalised latency, throughput, buffer occupancy, average router temperature, the fractions of faulty nodes, link faults, and thermally stressed routers, the current packet delivery ratio, the action selected in the preceding step, and the fractional progress through the episode. Three discrete actions are available, each corresponding to one FDU mode: FULL, REDUCED, or OFF. The underlying Q-network consists of two hidden layers of 64 units with ReLU activations, trained using the Adam optimiser at a learning rate of 0.001 and a discount factor of 0.96. Experience replay uses a buffer of 10,000 transitions sampled in batches of 64, with a target network synchronised every 100 training steps.

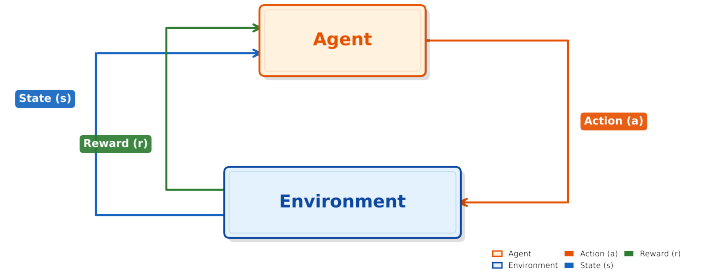


Fig. 3. Agent interaction with the environment in RL

The interaction between the DQN agent and the NoC environment follows the standard reinforcement learning loop illustrated in Fig. 3, where the agent observes a state s , selects an action a , and receives a reward r alongside the next state s' from the environment. At each training step, the Bellman target is computed using a frozen target network $\hat{\theta}$, kept separate from the online weights θ and synchronised every 100 steps to prevent target instability

$$y_t = r_t + 0.96 \cdot \max_{a'} \hat{Q}(s_{t+1}, a'; \hat{\theta}) \cdot (1 - d_t) \quad (2)$$

where d_t is a terminal flag and 0.96 is the discount factor γ . The online network is updated by minimising

$$\mathcal{L}(\theta) = \frac{1}{64} \sum_{t=1}^{64} [Q(s_t, a_t; \theta) - y_t]^2 \quad (3)$$

where gradients are propagated via Adam at a fixed learning rate of 0.001, applied through backpropagation across the full network rather than as a direct per-entry update.

C. Reward Design and Power Reliability Trade off

The reward signal shapes the agent's policy by simultaneously accounting for detection correctness, network throughput, monitoring energy, routing latency, and network energy. At each step t , the scalar reward received by the agent is:

$$r_t = 2\delta_c - 2(1 - \delta_c) + 2 \cdot \text{PDR}_t - 0.9E_{\text{mon}} - 0.05L_t - 0.03E_{\text{net}} \quad (4)$$

where δ_{correct} is a binary indicator equal to 1 if the FDU detection outcome matches the true fault state, and 0 otherwise. PDR_t denotes the packet delivery ratio at time step t , E_{monitor} represents the energy consumption of the FDU for the selected monitoring mode, L_t denotes the average packet latency, and E_{network} represents the total network energy consumption during the corresponding step.

D. Overall Decision Flow

At the start of each episode, the mesh network and fault model are re-initialised with fresh router states. The agent receives an initial state vector constructed from default zero-valued network metrics. For each of the 100 steps within the episode, the agent selects an FDU mode, the fault model updates router states by injecting and recovering faults, and the network processes one round of packet injection and routing. The FDU then evaluates whether a fault is present and returns a detection outcome. The resulting reward is computed, the transition is stored in the replay buffer, and during the training phase a mini-batch update is performed on the Q-network. The state vector is then reconstructed from the updated network metrics and passed to the agent for the next step. This closed loop repeats for all 500 episodes, with the policy frozen after episode 249 and held constant throughout the 250-episode evaluation window. Performance metrics energy, accuracy, and PDR are recorded per episode and aggregated across the evaluation phase for comparison against the legacy baseline.

IV. SIMULATION ENVIRONMENT

The complete simulation architecture as a side-by-side comparison of the two methods evaluated in this Fig. 4. The upper portion of the diagram establishes the four components shared across both methods bit-reversal traffic, FTXY routing, the 8x8 mesh network, and the fault model making clear that the only variable between the two configurations is how the Fault Detection Unit is controlled. This separation is deliberate; by holding all other parameters constant, any difference in measured outcomes can be attributed directly to the monitoring

strategy rather than to variations in routing behaviour, traffic load, or fault injection conditions. Both methods feed from the same foundations before diverging into their respective execution pipelines below. The lower half of the figure illustrates where the two methods structurally diverge. Method A follows a linear, episode-uniform flow the FDU operates at FULL mode throughout all 500 episodes with no decision logic, accumulating energy and detection outcomes passively at each step. Method B introduces an additional decision layer at the top of its per-step loop, where the agent selects the FDU mode before any fault injection or packet routing occurs, then closes the loop by computing a reward and updating the replay buffer during training. A further structural difference visible in the episode configuration row is the explicit train-and-evaluate split in Method B, absent entirely from Method A. The metrics collected at the bottom of both columns are identical energy, accuracy, and PDR ensuring that the final comparison is conducted on a consistent and directly comparable basis.

V. RESULTS

Results are reported across the full 500-episode run, with RL performance drawn from the evaluation phase (episodes 250–499) to exclude training-phase exploration bias. Fig. 5 shows monitoring energy over episodes for both methods. The legacy baseline holds at a constant 0.0295 throughout flat by construction. The RL method opens higher at 0.014 during early episodes, reflecting residual exploration, then drops sharply and plateaus around 0.0106 before episode 50, remaining there with minimal variation for the rest of the run. The gap between the two curves is large and consistent a 64% reduction in monitoring energy that does not erode over time. What stands out is not just the magnitude of the saving but its stability; the RL curve shows no upward drift during evaluation, suggesting the agent settled on a low-energy monitoring preference early and did not deviate from it under the fault conditions encountered across subsequent episodes.

The RL-controlled method begins with low accuracy near 0.68 due to early exploration but converges to a stable mean of 0.88 by episode 100, sustaining this throughout evaluation. The legacy system maintains a near-constant 0.99 across all 500 episodes, a direct result of its fixed FULL-mode operation with a 99% true positive rate. Fig. 6 shows the 11 percentage point accuracy gap is the deliberate cost of the agent learning to favour reduced monitoring under a fault injection rate of just 3% per step. The stabilised accuracy of 0.88 reflects a consistent, repeatable policy that avoids both always-on monitoring and complete detection shutdown. Taken alongside the 64% reduction in monitoring energy, this trade-off represents a practical and well-balanced outcome for energy-constrained NoC designs.

Fig. 7 compares packets delivered per episode across both methods, and unlike the energy and accuracy results, the two curves remain close throughout all 500 episodes. Both methods peak within 0.02 packets of each other legacy at 7.02 and RL at 7.0 and oscillate within broadly the same range across the full run. From episode 150 onwards, the RL curve

FTXY ROUTING · BIT REVERSAL TRAFFIC

Architecture Comparison — Method A: Legacy Full Monitoring vs Method B: RL-Controlled Monitoring (DQN)

SHARED SIMULATION FOUNDATIONS

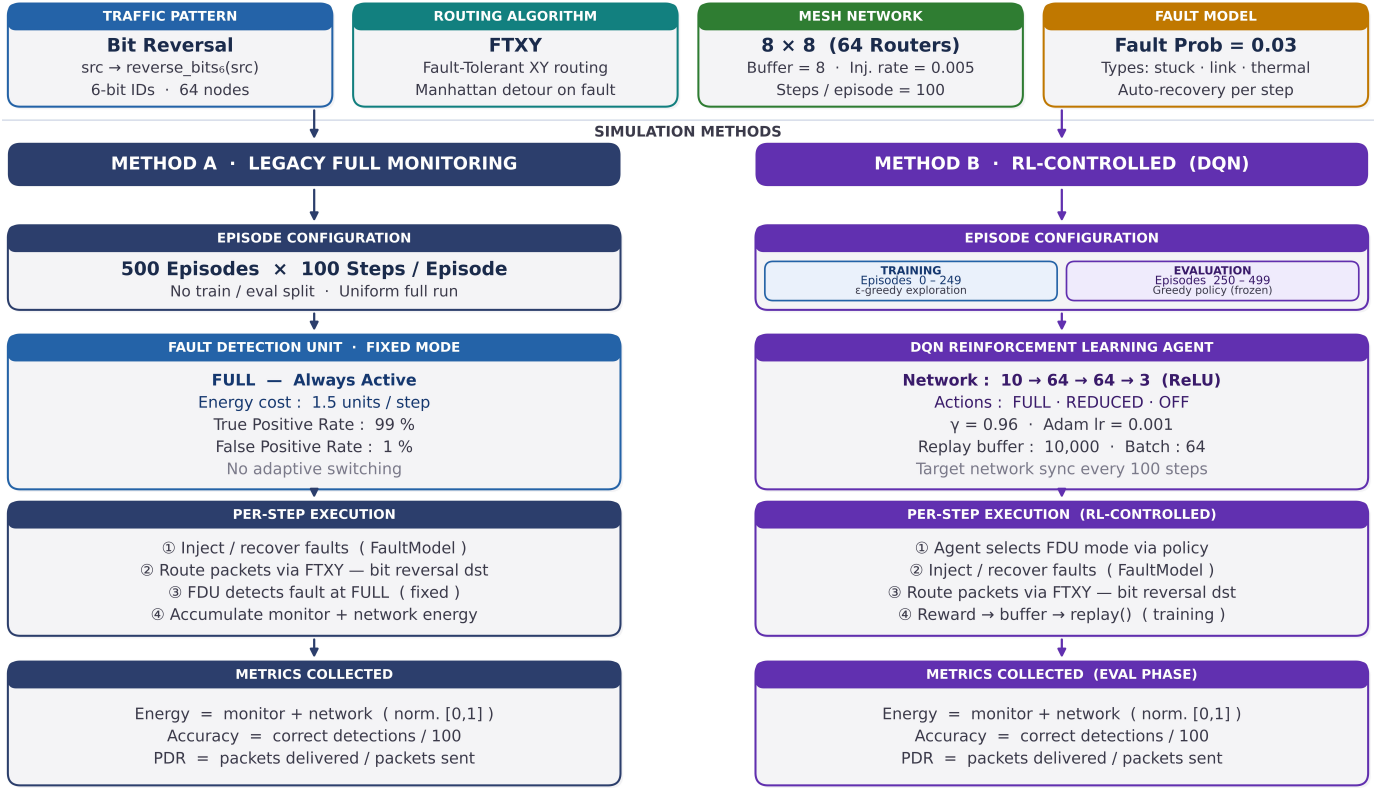


Fig. 4. FTXY routing on an 8x8 mesh NoC comparing static full monitoring against DQN-based adaptive fault detection under bit-reversal traffic.

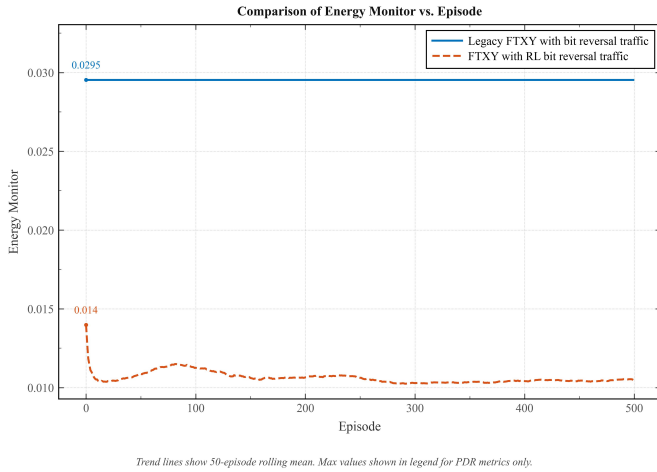


Fig. 5. Monitoring energy per episode comparison between Legacy FTXY (fixed full monitoring) and RL-controlled FTXY (DQN) under bit-reversal traffic on an 8x8 mesh NoC.

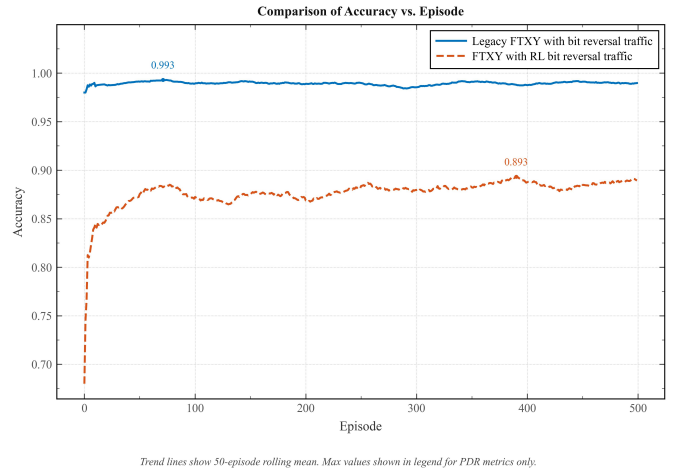


Fig. 6. Fault detection accuracy comparison over 500 episodes between Legacy FTXY (full monitoring) and RL-controlled FTXY (DQN) under bit-reversal traffic on an 8x8 mesh NoC.

frequently sits at or above the legacy baseline, indicating that reduced monitoring overhead causes no degradation in packet throughput. The variability visible in both curves is attributable

to stochastic fault injection rather than monitoring strategy, confirming that the agent's mode-switching decisions leave network throughput essentially undisturbed.

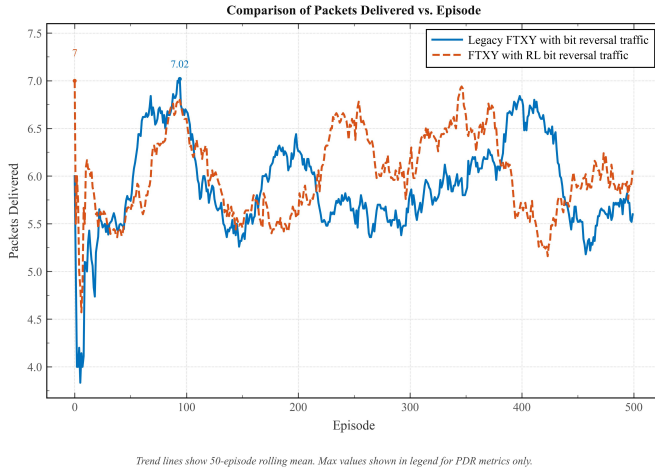


Fig. 7. Packets delivered per episode comparison between Legacy FTXY (fixed full monitoring) and RL-controlled FTXY (DQN) under bit-reversal traffic on an 8x8 mesh NoC.

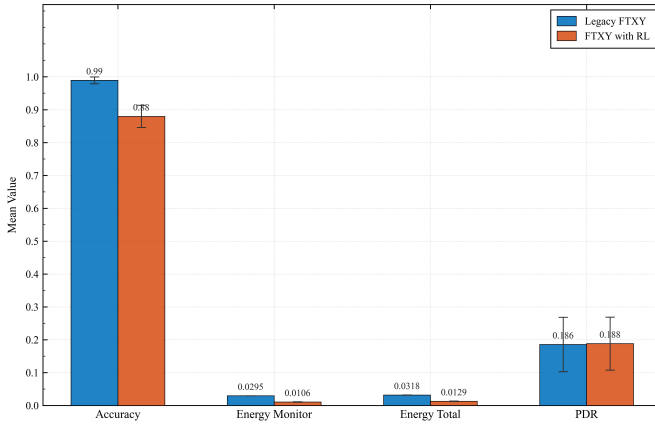


Fig. 8. Mean metric comparison between Legacy FTXY and RL-controlled FTXY (DQN) under bit-reversal traffic on an 8x8 mesh NoC.

Fig. 8 consolidates all four metrics into a single comparison, making the overall trade-off immediately visible. Energy monitor and total energy drop sharply under the RL method (0.0106 and 0.0129 respectively), while PDR edges marginally higher at 0.188 versus 0.186. Accuracy is the only metric where the legacy system holds a clear advantage, at 0.99 against 0.88.

Across all four dimensions, the RL method delivers a consistently more energy-efficient profile with throughput fully preserved, at a contained and predictable accuracy cost.

VI. CONCLSUION

The results make a clear case for policy-driven fault monitoring as a practical alternative to always-on detection in mesh NoC designs. Substantial reductions in both monitoring and total system energy were achieved without meaningful loss in packet delivery performance, confirming that the agent learned to identify when full monitoring was genuinely necessary and when a lower-cost mode was sufficient. The accuracy trade-

off, while measurable, proved consistent and stable across the evaluation phase rather than erratic, making it predictable enough to reason about at design time. For systems where energy budget is a binding constraint and fault coverage requirements allow some flexibility, the learned policy demonstrates that significant overhead reduction is achievable without dismantling detection capability entirely. The stability of the agent's behaviour through evaluation further suggests the policy generalises adequately within its training conditions. Beyond simulation, the practical implications of this work extend to real-world chip design: a 59% reduction in monitoring energy, if replicated at scale across many-core processors and data centre SoCs, could meaningfully extend chip operational lifetime by reducing thermal stress on router components, lower per-chip power budgets, and contribute incrementally to the broader effort of reducing the energy footprint of computing infrastructure. As data centres account for a growing share of global electricity consumption, techniques that trim unnecessary overhead at the micro-architectural level, however targeted, represent a concrete step toward more sustainable silicon design. Future work will extend this framework to uniform and alternative traffic patterns and evaluate additional routing algorithms beyond FTXY, to assess how well the learned policy holds across broader network operating conditions.

ACKNOWLEDGMENT

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