

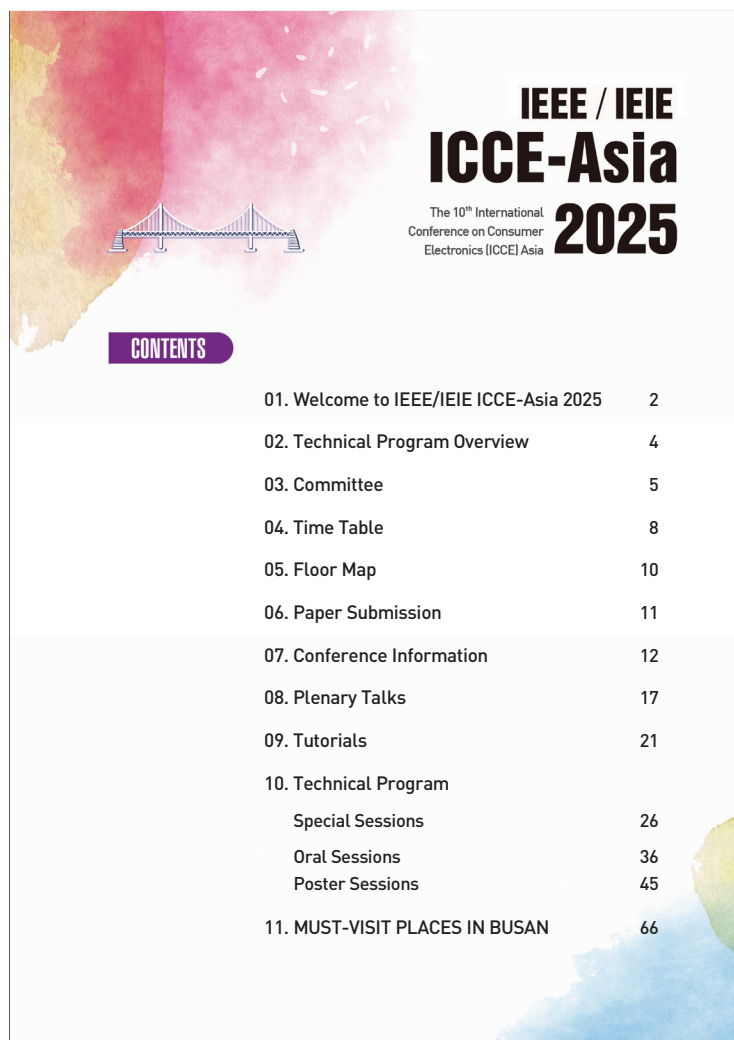


IEEE / IEIE

ICCE-Asia 2025

The 10th International
Conference on Consumer
Electronics (ICCE) Asia

10. 27^(Mon) - 10. 29^(Wed), 2025
Westin Josun Busan Hotel, South Korea



IEEE / IEIE
ICCE-Asia

The 10th International
Conference on Consumer
Electronics (ICCE) Asia

2025

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Welcome to ICCE-Asia 2025!

On behalf of the Institute of Electronics and Information Engineers (IEIE) and the IEEE Consumer Technology Society (IEEE CTSoc), it is my great honor and pleasure to welcome you to the IEEE/IEIE International Conference on Consumer Electronics Asia 2025, held at the Westin Josun Hotel in Busan, South Korea, from October 27 to 29, 2025.

This year is particularly meaningful as it marks the tenth anniversary of ICCE-Asia. Over the past decade, the conference has established itself as a premier forum for scholars, engineers, and industry leaders, contributing significantly to the advancement of consumer electronics, semiconductors, artificial intelligence, and related technologies. The steady growth of ICCE-Asia reflects the dedication of our community and its commitment to pushing the boundaries of research and innovation in these rapidly evolving fields.

We are delighted to present a diverse and stimulating program this year. Distinguished plenary talks will be delivered by Prof. Kenichi Okada from the Institute of Science Tokyo on *“Millimeter-wave circuit innovations for 6G and beyond”*, and by Prof. Myoungsoo Jung from KAIST and Pannnesia on *“AI infrastructure innovation for next-generation semiconductor and datacenter solutions”*.

In addition, four tutorial sessions will offer in-depth perspectives on emerging fields. Prof. Sangyoon Han from DGIST will provide *“A Brief Introduction to Silicon Photonic Circuit Design”*, and Prof. Minkyu Je from KAIST will present *“Advances in Capacitance-to-Digital Converters”*. Prof. Jong-Won Shin from Seoul National University will deliver a tutorial on *“Low-voltage DC-DC Converter Technology of Electrified Vehicles”*, while Prof. Namhyuk Ahn from Inha University will address the important topic *“Toward Ethical Generative AI: Protecting Users from Diffusion Models”*. Together, these sessions highlight both the technological depth and the social responsibility that shape the future of consumer electronics.

The conference program is further enriched by eleven special sessions, covering cutting-edge areas such as energy-efficient processors and semiconductor technologies for AI, hyperconnectivity for 6G, quantum algorithms, biomedical circuits, human-level robot interaction, and highlights of AI research from Inha University's BK21 program.

We are also proud to share that ICCE-Asia 2025 has attracted an impressive **312 accepted papers from 13 countries** including Korea, Japan, China, Taiwan, the USA, Kazakhstan, the Philippines, Singapore, Switzerland, Thailand, Bangladesh, Belgium, and Malaysia. Such



diversity underscores the truly global nature of ICCE-Asia and the strength of our international community.

I would like to express my deepest gratitude to the Organizing Committee and the Technical Program Committee for their tireless efforts in preparing this event, and to all the authors and participants for their valuable contributions. I also wish to acknowledge our sponsors, including Samsung Electronics, the Korea Tourism Organization, the Busan Tourism Organization, KETI, ETRI, and SNU POLARIS, for their generous support that has made this conference possible.

Finally, I warmly welcome you to Busan, a dynamic city that combines modern industry with rich cultural heritage and beautiful coastal scenery. I hope that ICCE-Asia 2025 will not only provide you with fruitful academic discussions and professional growth but also offer memorable experiences in this vibrant city.

Sincerely,

General Chair**Prof. Byung Cheol Song**

Vice President of the IEIE
Inha University, South Korea

General Co-Chair**Prof. Fabrice Labeau**

President of the IEEE CTSoc.
McGill University, Canada

Organizing Committee Chair**Prof. Jaehyook Choi**

Seoul National University, South Korea

Organizing Committee Co-Chair**Prof. Hyun Jong Yang**

Seoul National University, South Korea

Technical Program Overview

It is my great honor to welcome all of you to ICCE-Asia 2025 on behalf of the entire Technical Program Committee. I would like to extend my heartfelt gratitude to all program committee members, reviewers, and organizing committee members whose tireless efforts and dedication have made this outstanding technical program possible.

This year, we received more than 312 paper submissions from 10 countries, reflecting the growing international interest in consumer electronics and related technologies. The program is structured into 9 oral presentation sessions, 4 poster sessions, and 11 special sessions. The topics of the technical program cover artificial intelligence, machine learning, semiconductor technology, image/video processing, IoT, security, robotics, wireless technologies, and consumer electronics.

We are privileged to feature two distinguished plenary speakers: Kenichi Okada (Institute of Science Tokyo, Japan) and Myoungsoo Jung (KAIST & Pannnesia, Korea). In addition, four tutorials will provide both theoretical foundations and practical insights, offering valuable knowledge and sparking innovative discussions among participants.

I am confident that ICCE-Asia 2025 will serve as an exceptional platform for knowledge exchange, fostering new collaborations, and advancing the frontiers of consumer electronics technology. This conference represents a unique opportunity to engage with leading experts, discover breakthrough research, and build lasting professional networks.

Thank you very much for your participation. I wish you a productive and inspiring conference experience.

Technical Program Committee Chair**Prof. Ji-Hoon Kim**

Hanyang University, South Korea

Technical Program Committee Co-Chairs**Prof. Min-Jae Seo**

University of Seoul, South Korea

Dr. Byung-Soo Kim

KETI, South Korea

**Committee****Organizing Committee****General Chair**

Byung Cheol Song (Inha University)

General Co-Chair

Fabrice Labeau (President of IEEE CTSoc.) (McGill University, Canada)

Organizing Committee Chair

Jaehyook Choi (Seoul National University)

Organizing Committee Co-Chair

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Min-Jae Seo (University of Seoul)

Byung-Soo Kim (KETI)

Tutorial Chair

Kyuho Jason Lee (Yonsei University)

Special Session Organizing Chair

Minkyu Je (KAIST)

Special Session Organizing Co-Chair

Min-Seong Choo (Hanyang University)

Publicity Chair

Gain Kim (DGIST)

Registration Chair

Joo-Hyung Chae (Kwangwoon University)

Financial Chair

Hongki Lim (Inha University)

Publication Chair

Kwanseo Park (Yonsei University)

Publication Co-Chair

Hyunbum Kim (Incheon National University)

Local Arrangement Chair

Jiseon Paek (Pusan National University)



Technical Program Committee

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Ji-Hoon Kim (Hanyang University)

TPC Co-Chair

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Min-Jae Seo (University of Seoul)

TPC Member

Younghyun Lim (Kyung Hee University)

Minyoung Song (DGIST)

Dongryeol Oh (Jeju National University)

Kyuhyun Choi (KETI)

Hyokeun Lee (Ajou University)

Seongah Jeong (University of Seoul)

Kyoungtae Lee (DGIST)

Time Table

October 27, Monday, 2025

Time	Grand Ballroom B (1F)	Rose Room (2F)	Lilac Room (2F)	Tulip Room (2F)	Cosmos Room (2F)
14:30-16:00 (90)	Registration (Lobby, 1F)				
15:15-16:15 (60)		Tutorial 1 A Brief Introduction to Silicon Photonic Circuit Design Sangyoon Han (DGIST)	Tutorial 2 Toward Ethical Generative AI: Protecting Users from Diffusion Models Namhyuk Ahn (Inha University)		
16:15-16:30 (15)	Break Time				
16:30-17:30 (60)		Tutorial 3 Low-voltage DC-DC converter technology of electrified vehicles JONG-WON SHIN (Seoul National University)	Tutorial 4 Advances in Capacitance-to-Digital Converters Minkyu Je (KAIST)		
17:30-17:40 (10)	Break Time				
17:40-19:00 (80)	Welcome Reception				

October 28, Tuesday, 2025

Time	Grand Ballroom B (1F)	Rose Room (2F)	Lilac Room (2F)	Tulip Room (2F)	Cosmos Room (2F)
08:30-16:00	Registration (Lobby, 1F)				
09:00-10:20 (80)	Poster Session 1 SNU	[SS-01] Analog and Mixed-Signal Integrated Circuits and Systems	[SS-02] Energy-Efficient and High-Performance Processors for AI	[SS-03] Energy-Efficient AI Semiconductor Technologies	[SS-05] Generative AI for Computer Vision Problems
10:20-10:30 (10)	Break Time				
10:30-10:45 (15)	Opening Ceremony (Grand Ballroom A, 1F)				
10:45-11:30 (45)	Plenary Talk 1 (Grand Ballroom A, 1F) Millimeter-Wave Circuit Innovations for 6G and Beyond Prof. Kenichi Okada (Institute of Science Tokyo)				
11:30-12:15 (45)	Plenary Talk 2 (Grand Ballroom A, 1F) AI Infrastructure Innovation Driven by Memory- and Link-centric Semiconductor and Datacenter Interconnection Solutions / Prof. Myoungsoo Jung (KAIST & Panmnnesia)				
12:15-13:30 (75)	Lunch (Grand Ballroom A, 1F)				



October 28, Tuesday, 2025

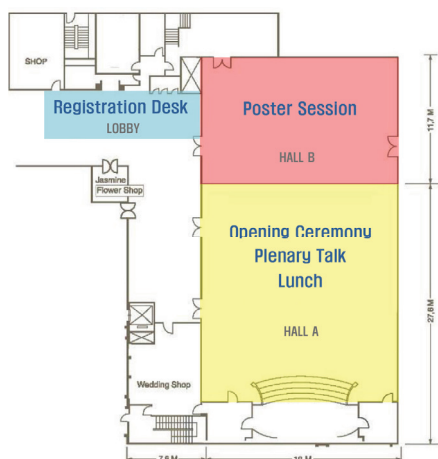
Time	Grand Ballroom B (1F)	Rose Room (2F)	Lilac Room (2F)	Tulip Room (2F)	Cosmos Room (2F)
13:30-14:50 (80)	Poster Session 2	[SS-08] Highlights of AI Research Achievements by Inha University's BK21 Program	[SS-10] SNU Graduate School of AI Semiconductor	Panmnnesia-KETI Workshop	Panmnnesia-KETI Workshop
14:50-15:00 (10)	Break Time				
15:00-16:20 (80)	Poster Session 3	[SS-09] Quantum Algorithms: From Modeling to Execution	[SS-07] High-speed Communication Circuits and Systems	Panmnnesia-KETI Workshop	Panmnnesia-KETI Workshop
16:20-16:30 (10)	Break Time				
16:30-17:50 (80)	Poster Session 4	[OS-01] Smart City CE and AI Applications	[OS-02] AI-Enhanced Consumer Electronics	[OS-03] AI/ML for Consumer Electronics and Smart Mobility	[OS-04] Human-Centered CE: Sensing, Interaction, and Immersive Experiences
17:50-18:20 (20)	Break Time				
18:20~	Banquet (Grand Ballroom A, 1F)				

October 29, Wednesday, 2025

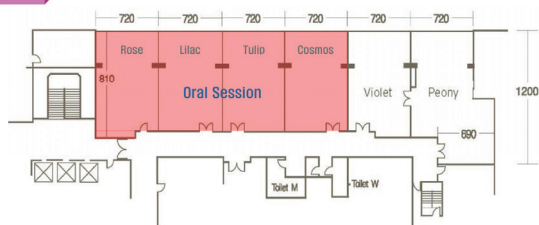
Time	Grand Ballroom B (1F)	Rose Room (2F)	Lilac Room (2F)	Tulip Room (2F)	Cosmos Room (2F)
08:30-10:30	Registration (Lobby, 1F)				
09:00-10:20 (80)		[OS-05] Advances in Entertainment, Gaming, and XR Technologies	[SS-04] Hyperconnectivity for 6G and beyond	[SS-06] Low-Power Intelligent Biomedical Circuits and Systems	[SS-11] Handing Global University
10:20-10:30 (10)	Break Time				
10:30-12:00 (90)		[OS-06] Next-Generation IoT Applications for Smart CE	[OS-07] Wireless, Networked, and Emerging CE Technologies	[OS-08] Automation, Drones, and Secure CE Applications	[OS-09] Core Consumer Electronics Technologies

Floor Map

1F



2F



Paper Submission



Topic & Information

TOPICS

- Artificial Intelligence and Machine Learning for CE Applications (AIM)
- Robotics, Drones, Automation Technologies and Interfaces (RDA)
- Security and Privacy of CE Hardware and Software Systems (SPC)
- Energy Management of CE Hardware and Software Systems (EMC)
- Application-Specific CE for Smart Cities (SMC)
- RF, Wireless, and Network Technologies (WNT)
- Internet of Things and Internet of Everywhere (IoT)
- Entertainment, Gaming, and Virtual and Augmented Reality (EGV)
- AV Systems, Image and Video, and Cameras and Acquisition (AVS)
- Automotive CE Applications (CEA)
- CE Sensors and MEMS (CSM)
- Consumer Healthcare Systems (CHS)
- Enabling and HCI Technologies (HCI)
- Smartphone and Mobile Device Technologies (MDT)
- Semiconductor Devices for Consumer Electronics (SCE)
- Other Technologies Related with CE (MIS)

BEST PAPER AWARDS

- Award for Excellent Undergraduate Paper (Poster Presentation)
 - Best Lab / Excellent Lab
- Award for Excellent Research Performance
 - 10 Excellent Undergraduate Papers

Conference Information



Registration

Registration Notice

- Pre-registration Deadline: **October 10, 2025**
 - After this date, on-site registration rates will apply.
- Registration Requirement for Authors with Accepted Papers:
To present your paper at ICCE-Asia 2025:
 - **At least one Regular Registration is required per paper, regardless of the author's title or affiliation (professor, student, etc.).**
 - **If the same author has multiple accepted papers, only the first paper requires a Regular Registration.** From the second paper onward, Student Registration may be used only if the presenting or corresponding author is the same person.
 - **Undergraduate students may register with Undergraduate Registration.**

Number of Accepted Papers (same author)	Required Registration
1 Paper	1×Regular Registration
2 Papers	1×Regular Registration + 1×Student Registration
3 Papers	1×Regular Registration + 2×Student Registrations

Receipts & Participation Certificates

- Receipts and Participation Certificates:
 - Issued only to authors who have completed payment of registration fees.
 - Available for download after payment is confirmed.
 - All documents will be issued under the registrant's name and cannot be changed after issuance.

Download Instructions (★)

LOGIN ► Go to [MY PAGE] (top right) ► Click Registration Number
► Download the receipts and certificates



Pre-Registration Fee

- Due date for pre-registration is by

Category	* The pre-registration price is applicable only during the pre-registration period. (until)			
	IEEE/IEIE Member	Non-member of IEEE, IEIE	IEEE CT Society Member	IEEE Life Member
Regular Registration	USD 610	USD 760	USD 570	USD 190
Student Registration	USD 380	USD 540	USD 350	-
Undergraduate Registration	USD 190	USD 270	USD 175	-
Tutorial Only	USD 72			
Additional Banquet	USD 100			

On-site registration Fee

- After the pre-registration period ends, this price will apply.

Category	IEEE/IEIE Member	Non-member of IEEE, IEIE	IEEE CT Society Member	IEEE Life Member
Regular Registration	USD 760	USD 950	USD 720	USD 190
Student Registration	USD 480	USD 670	USD 430	-
Undergraduate Registration	USD 250	USD 330	USD 230	-
Tutorial Only	USD 72			
Additional Banquet	USD 100			

Registration Fee Includes

- Regular Registration
Admission to All Sessions, Proceedings, Coffee Breaks, **Banquet**, Lunch, Gift
- Student Registration
Admission to All Sessions, Proceedings, Coffee Breaks, Lunch, Gift
*** A Banquet ticket is not included**
- Undergraduate Registration
Admission to All Sessions, Proceedings, Coffee Breaks, Lunch, Gift
*** A Banquet ticket is not included**

Cancellation & Refund Policy

- To cancel your registration, please send a cancellation request to the Secretariat via email: inter@theieie.org
 - A refund will be issued **minus a processing fee of USD 100 or KRW 140,000** if the cancellation is requested **on or before (KST)**.
 - **No refunds or cancellations** will be processed **after (KST)**.
 - Refunds are not available for **No-Shows** at the conference.
- ※ All dates and times are based on Korean Standard Time (KST).**



Social Program

Welcome Reception

Date: October 27th, Monday
Time: 17:40 ~
Location: Restaurant <The bay 101>

Opening Ceremony

Date: October 28th, Tuesday
Time: 10:30 - 10:45
Location: Grand Ballroom A (1F)
*All registered participants are cordially invited to join us and celebrate the official opening.

Plenary Talk 1

Date: October 28th, Tuesday
Time: 10:45 - 11:30
Location: Grand Ballroom A (1F)

Plenary Talk 2

Date: October 28th, Tuesday
Time: 11:30 - 12:15
Location: Grand Ballroom A (1F)

Banquet & Best Paper Awards

Date: October 28th, Tuesday
Time: 18:20 ~
Location: Grand Ballroom A (1F)

Lunch

*Full Registration and Student Registration include one lunch on the following dates:
Date: October 28th, Tuesday
Time: 12:15 - 13:30
Location: Grand Ballroom A (1F)



Presentation Guidelines

Oral Presentations

- Please go into the session room at least **10 minutes** before the session starts and identify yourself to the session chair.
- Please submit the presentation slide. You need to bring your ppt file on USB memory, and load it on the computer in your session room. You also need to confirm whether it is working properly. This is very important to pay attention to this time frame. The visual equipment provided is a beam projector.
- Time assignment including discussion is as follow
 - **Oral Presentation (SS + Oral) : 12 minutes presentation per presenter (3 minutes of Q&A included)**

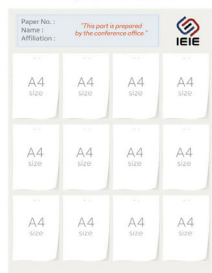
Poster Presentations

- You need to prepare your poster within this size and attach it on the poster board in your session room at least 10 minutes before the session starts, and then remove your poster immediately after the session finishes
- Authors (or presenters) are expected to adhere to the following formal guidelines:
 1. Set up your posters in advance of the session.
 2. Be in attendance with your poster throughout the poster session.
 3. Present and elucidate your papers to the assembled audience

Poster Presentation Guidelines
Example 1) A0 size *1 sheet



Poster Presentation Guidelines
Example 2) A4 size *12 sheets



Plenary Talks



Plenary Talk 1

10:45-11:30

October 28, Tuesday, 2025

Grand Ballroom A, 1F

Prof. Kenichi Okada
Institute of Science Tokyo



Millimeter-Wave Circuit Innovations for 6G and Beyond

Abstract

Millimeter-wave (mmWave) and sub-terahertz (Sub-THz) circuit technologies are becoming essential for the realization of future wireless communication systems such as 6G, beyond 5G, and advanced satellite networks. These technologies are driven by the growing need for ultra-high data rates, wide-area coverage, and massive device connectivity. This talk introduces recent advances in circuit-level innovations that enable scalable, energy-efficient, and high-performance wireless transceivers operating at mmWave and Sub-THz frequencies. In particular, I highlight the development of Sub-THz transceivers designed for long-distance, high-throughput links and explore new architectures that push the boundaries of spectral efficiency. In addition, I present a discrete-time approach to mmWave massive MIMO systems, enabling flexible and digitally-compatible phased-array implementations that support Time Division MIMO (TD-MIMO) schemes. These design strategies help address critical challenges such as power consumption, integration complexity, and propagation loss at high frequencies. Drawing on both theoretical insights and recent experimental results, this presentation explores future directions in circuit design that support the evolution of intelligent and high-capacity wireless communication systems.

Biography

Kenichi Okada received the B.E., M.E., and Ph.D. degrees in communications and computer engineering from Kyoto University, Kyoto, Japan, in 1998, 2000, and 2003, respectively. From 2000 to 2003, he was a Research Fellow of the Japan Society for the Promotion of Science in

Kyoto University. In 2003, he joined Tokyo Institute of Technology as an Assistant Professor, where he is currently a Professor of electrical and electronic engineering in Institute of Science Tokyo. He has authored or co-authored more than 500 journal and conference papers. His current research interests include millimeter-wave and terahertz CMOS wireless transceivers for 20/28/39/60/77/99/100/300GHz for 5G, WiGig, satellite and future wireless systems, digital PLL, synthesizable PLL, atomic clock, and ultra-low-power wireless transceivers for Bluetooth Low-Energy, and sub-GHz applications.

Prof. Okada is a member of the Institute of Electrical and Electronics Engineers (IEEE), the Institute of Electronics, Information and Communication Engineers (IEICE), the Information Processing Society of Japan (IPSJ), and the Japan Society of Applied Physics (JSAP). He was a recipient or co-recipient of the Ericsson Young Scientist Award in 2004, the A-SSCC Outstanding Design Award in 2006 and 2011, the ASP-DAC Special Feature Award in 2011 and Best Design Award in 2014 and 2015, the MEXT Young Scientists' Prize in 2011, the JSPS Prize in 2014, the Suematsu Yasuharu Award in 2015, the MEXT Prizes for Science and Technology in 2017, the RFTT Best Paper Award in 2017, the IEICE Best Paper Award in 2018, the RFIC Symposium Best Student Paper Award in 2019, the IEICE Achievement Award in 2019, the DOCOMO Mobile Science Award in 2019, the IEEE/ACM ASP-DAC Prolific Author Award in 2020, the Kenjiro Takayanagi Achievement Award in 2020, the KDDI Foundation Award in 2020, the IEEE CICC, Best Paper Award in 2020, the IEEE ISSCC Author-Recognition Award in 2023, the IEEE A-SSCC Top-11 Contributor Award, IEEE MWCL Tatsuo Itoh Best Paper Award, and more than 50 other international and domestic awards. He is a Fellow of IEEE. He is/was a member of the technical program committees of IEEE International Solid-State Circuits Conference (ISSCC), VLSI Circuits Symposium, European Solid-State Circuits Conference (ESSCIRC), Radio Frequency Integrated Circuits Symposium (RFIC), Asian Solid-State Circuits Conference (A-SSCC), and he is/was also Guest Editors and an Associate Editor of IEEE Journal of Solid-State Circuits (JSSC), an Associate Editor of IEEE Transactions on Microwave Theory and Techniques (T-MTT), a Distinguished Lecturer and AdCom member of the IEEE Solid-State Circuits Society (SSCS).

**Plenary Talk 2**

11:30–12:15

October 28, Tuesday, 2025

Grand Ballroom A (1F)

Prof. Myoungsoo Jung
KAIST & Panmnesia**AI Infrastructure Innovation Driven by Memory- and Link-centric Semiconductor and Datacenter Interconnection Solutions****Abstract**

The Compute Express Link (CXL) has recently gained attention in the technology community due to its promising capabilities in managing hardware heterogeneity and streamlining resource disaggregation. While there are currently no commercial products or platforms that integrate CXL into memory pooling, it is expected to substantially enhance memory resource disaggregation in the near future. Particularly, the rapid evolution of AI workloads, including large language models (LLMs), necessitates robust and flexible infrastructure that traditional data center designs struggle to provide. CXL technology addresses these challenges by enabling more efficient integration and disaggregation of compute, memory, and storage resources, thereby optimizing data center scalability and performance for AI-centric applications.

In this talk, we will provide an overview of CXL, explaining its importance and discussing the current state of the industry through the lens of a real-world example. We will emphasize the transformative potential of CXL for AI infrastructure and how its implementation can enhance data center efficiency and resource utilization.

This talk will include Panmnesia's silicon-proven CXL controller and full hardware IP stack, as well as several emerging CXL-enabled applications integrated with Panmnesia's CXL solutions such as CXL-GPU and CXL-augmented AI systems. Specifically, during the presentation, we will delve into the reasons behind the need for a new interface for cache coherence in existing computing and memory resources, particularly within AI-driven data centers. We will also explore how CXL IPs can play a pivotal role in integrating various types of resources into a disaggregated pool, significantly advancing data center architectures designed for intensive AI workloads.

To better illustrate this concept, we will discuss two real-world system examples: first, several CXL end-to-end systems that establish a direct connection between a host processor complex and remote memory resources using CXL's switch (2.0) and fabric (3.1) memory protocols; second, a prototype storage expansion system incorporating CXL technology for enhanced performance in data center environments. In the final segment of our talk, we will briefly introduce an array of hardware prototypes, including a CXL-enabled GPU system specifically designed to support future AI infrastructure demands. These prototypes form part of our ongoing project aimed at accelerating the development and adoption of CXL technology within modern data centers optimized for AI.

Biography

Dr. Myoungsoo Jung is The KAIST Endowed Chair Professor and leads the CAMEL research group (<http://camelab.org>). He is also the CEO and Founder of Panmnesia, a KAIST-based start-up (<https://panmnesia.com/>). Dr. Jung obtained his Ph.D. in Computer Science from Pennsylvania State University, his M.S. in Computer Science from Georgia Institute of Technology and Korea University. With extensive industry experience, Dr. Jung holds numerous U.S. patents related to multi-channel SSDs and has authored over a hundred research papers on SSD flash firmware and kernel-level file systems. His work has been published in leading conferences, including SOSP, OSDI, ISCA, MICRO, ASPLOS, FAST, USENIX ATC, and HPCA. Dr. Jung has received core grant awards from the National Science Foundation (NSF), Department of Energy (DOE), and National Research Foundation (NRF).

In recognition of his outstanding contributions, he has been honored with CES Innovation Award (2025/2024), Award for Outstanding Contribution at the ICT Technology (2025), IEEE/ACM ISCA Hall of Fame (2024), ICT Digital Innovation Award (2024), NVMW Memorable Paper Award (2022), Samsung Best Paper Award (2022), and the Lawrence Berkeley National Laboratory Award (LBNL) of Excellence. Dr. Jung's current research interests encompass cache coherent interconnects (such as CXL), coprocessor architecture, FPGA-based accelerators, advanced computer architecture, and operating systems on emerging non-volatile memory and solid-state drive technologies.

**Tutorials****Tutorial 1**

15:15–16:15

October 27, Monday, 2025

Rose Room + Lilac Room (2F)

Chair: Min-Jae Seo (University of Seoul)

Sangyoon Han
Associate Professor at DGIST**A Brief Introduction to Silicon Photonic Circuit Design****Abstract**

This tutorial provides a comprehensive introduction to silicon photonics, a key technology for next-generation AI and quantum computing. We will cover the operating principles of core components—including waveguides, modulators, and photodetectors—and explain how heterogeneous integration overcomes silicon's fundamental limitations.

The presentation will detail the modern design flow, from simulation using specialized tools to layout and fabrication via foundry MPW services, while addressing key technological challenges arising from the wave nature of light.

Finally, we will spotlight innovative applications like optical AI accelerators and quantum computers. The speaker's own research, featuring MEMS-based devices that reduce standby power by a factor of a million (Nature Photonics, 2023) and the ongoing Korea-EU HAETAE Project, will be presented to illustrate the technology's immense potential.

Biography

Sangyoon Han is an Associate Professor at DGIST specializing in silicon photonics and photonic AI hardware. He received his B.S. from Seoul National University and his Ph.D. from UC Berkeley. He pioneers the integration of MEMS with photonic circuits to create ultra-low-power & large-scale AI processors, LiDAR, and quantum photonic circuits. His 2023 Nature Photonics paper introduced a photonic processor with a million-fold reduction in standby power, earning significant acclaim. He leads major international projects, including the Korea-EU HORIZON-JU-Chips initiative, and collaborates with industry leaders like Meta and Samsung to develop next-generation optical computing systems.

 Tutorial 2

15:15–16:15

October 27, Monday, 2025

Tulip Room + Cosmos Room [2F]

Chair: Hongki Lim (Inha University)

Namhyuk Ahn
Assistant Professor at Inha University**Toward Ethical Generative AI: Protecting Users from Diffusion Models****Abstract**

In recent years, generative AI models such as diffusion models have significantly transformed the way we produce multimedia content. However, their increasing capabilities have also raised serious concerns about misuse, including copyright infringement, unauthorized replication of artistic styles (e.g. Ghibli-style generation via ChatGPT), and identity-based harms such as deepfakes.

In response, the research community has begun exploring methods to mitigate the malicious use of diffusion models. This tutorial begins with an overview of three key approaches: (1) image watermarking, (2) concept erasure, which aims to remove sensitive or copyrighted attributes from pre-trained diffusion models, and (3) mimicry prevention, which is the main focus of the session.

We take a deep dive into mimicry prevention designed to resist personalization scenarios on foundation models. We introduce recent research efforts that enable imperceptible yet robust protection against such misuse, while also discussing their limitations, ethical implications, and future directions for building more responsible and consent-aware generative AI systems.

Biography

Namhyuk Ahn is an Assistant Professor in the School of Electrical and Electronic Engineering at Inha University. He received his B.S. in Media and Ph.D. in Artificial Intelligence from Ajou University, and previously worked as an AI researcher at NAVER Webtoon AI from 2021 to 2024. His research focuses on generative AI and multimodal content creation, with particular interest in controllable generation, user-centric creativity, and ethical challenges such as data leakage prevention and misuse mitigation. He is also broadly interested in the convergence of generative AI with other domains (Gen AI + X), aiming to develop methods that are both practically useful and socially responsible.

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 **Tutorial 3**

16:30–17:30

October 27, Monday, 2025

Rose Room + Lilac Room [2F]

Chair: Kyuho Jason Lee (Yonsei University)

JONG-WON SHIN
Associate Professor at Seoul National University**Low-voltage DC-DC converter technology of electrified vehicles****Abstract**

Autonomous driving of electric vehicles (EVs) increases the low-voltage loads supported by 12-V or 48-V supported by auxiliary battery. The tutorial briefly reviews the power architecture of EVs, and focuses on recent developments of on-board battery charger (OBC) and low-voltage DC-DC converter (LDC): for OBC, single-stage power factor correction rectifier is reviewed; for LDC, starting from the bus voltage transition from 12 V to 48 V lead by Tesla, conversion circuit topology, magnetics design, and prognostics techniques for FET are introduced.

Biography

JONG-WON SHIN received the B.S. and Ph.D. degrees in electrical engineering from Seoul National University, Seoul, South Korea, in 2006 and 2013, respectively. From 2013 to 2015, he was a Postdoctoral Researcher with Virginia Tech, Blacksburg, VA, USA. From 2015 to 2018, he was a Senior Scientist with the Electronics Research Department, Toyota Research Institute of North America, Ann Arbor, MI, USA. He worked in Chung-Ang University, Seoul, Korea, as an Assistant Professor from 2018 to 2022 and as an Associate Professor from 2022 to 2024. He joined Seoul National University, Seoul, Korea, in 2024, where he is currently an Assistant Professor in Department of Electrical and Computer Engineering and a member of Seoul National University electric power research institute (SEPRI). From 2021 to 2024, he was also a Visiting Associate Professor with Nagoya University, Nagoya, Japan. His research interests include power conversion, energy management, and power semiconductor packaging.

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 Tutorial 4

16:30–17:30

October 27, Monday, 2025

Tulip Room + Cosmos Room [2F]

Chair: Min-Jae Seo (University of Seoul)

Minkyu Je
KAIST**Advances in Capacitance-to-Digital Converters****Abstract**

Capacitive sensors are extensively utilized for IoT applications due to their low noise and temperature dependence. They can be used to sense a broad range of physical quantities, such as pressure, humidity, acceleration, gas molecules, and proximity. To read out such sensors and extract useful information, high-performance capacitance-to-digital converters (CDCs) are required. Their design is quite challenging due to many design trade-offs that must be made among performance parameters such as energy efficiency, sensing resolution, and input range. In this talk, the basic principles of capacitive sensors, the design goals and tradeoffs of CDCs, and conventional circuit structures will first be reviewed. Then, more recent and advanced circuit structures and design techniques to improve energy efficiency, sensing resolution, and input range will be presented. Lastly, some future research directions in the design and application of CDCs will be discussed.

Biography

Minkyu Je received his B.S., M.S., and Ph.D. degrees in Electrical Engineering and Computer Science from KAIST, Daejeon, Korea, in 1996, 1998, and 2003, respectively. In 2003, he joined Samsung Electronics, Korea, as a Senior Engineer. From 2006 to 2013, he was with IME, A*STAR, Singapore. From 2011 to 2013, he led the Integrated Circuits and Systems Laboratory at IME as a Department Head. He also served as Program Director of the NeuroDevices Program under A*STAR SERC from 2011 to 2013. He was an Associate Professor at DGIST, Korea, from 2014 to 2015. Since 2016, he has been an Associate Professor in the School of Electrical Engineering at KAIST, Korea.

His research includes the development of advanced IC platforms for smart sensor interfaces, low-power wireless communication, high-efficiency energy supply and management,

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low-power timing, and resource-constrained computing. He also works on microsystem integration, leveraging these IC platforms for emerging applications such as intelligent miniature biomedical devices, ubiquitous wireless sensor nodes, and future mobile devices.

He is an editor of one book, an author of six book chapters, and has more than 360 peer-reviewed international conference and journal publications. He also has more than 70 patents, either issued or filed. He has served on the Technical Program Committee and Organizing Committee of various international conferences, symposiums, and workshops, including IEEE ISSCC, A-SSCC, and SOVC. He was a Distinguished Lecturer of the IEEE CASS from 2020 to 2022 and is currently serving as an Associate Editor of IEEE TBioCAS.

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Technical Program



Special Sessions

SS01 Analog and Mixed-Signal Integrated Circuits and Systems

09:00-10:20 October 28, Tuesday, 2025

Rose Room (2F)

Chair: Min-Jae Seo (University of Seoul), Joo-Hyung Chae (Kwangju University)

- 01 A Wide Parallel Data Accessible 16-Kb SRAM for Computation Acceleration**
Jiwon Lee¹, Junsung Park², Ho-Sung Lee², Ik-Hyeon Jeon², and Joo-Hyung Chae²
(¹Micron Technology, Taiwan, ²Kwangju University, Korea)
- 02 Implementation and performance analysis of an Asynchronous DLD0 with low power and fast transient response without output capacitor**
Jacyeon Won and Jooyeol Rhee
(Gachon University, Korea)
- 03 A 3T2C eDRAM CIM Macro with Two-Step Sense Amplifier and Calibration Cell for Ternary Neural Network Inference**
Gyu-Seob Jeong¹, Wooham Bae¹, Dong-Hyun Lee², Seung-Mo Jin², Dong-Ho Kim², Seung-Hwan, Gong², Jae-Geon Lee², Jae-Hyeon Pyeon², In-Ho Han², and Min-Seong Choo²
(¹Ayar Labs, USA, ²Hanyang University, Korea)
- 04 A Compact 6T SRAM CIM Macro for Binary/Ternary Deep Neural Networks With 1-bit ADC and Error-Aware Training Algorithm**
Gyu-Seob Jeong¹, Wooham Bae¹, Dong-Hyun Lee², Seung-Mo Jin², Dong-Ho Kim², Seung-Hwan Gong², Jae-Geon Lee², Jae-Hyeon Pyeon², In-Ho Han², and Min-Seong Choo²
(¹Ayar Labs, USA, ²Hanyang University, Korea)
- 05 FVF-Based LD0 using dynamic current controlling switch**
Chanhyuck Kang¹, Hyeonjae Yoo², and Jooyeol Rhee¹
(¹Gachon University, Korea, ²Vieworks, Korea)
- 06 Design and Analysis of a Stable TIA with Rate of Closure Analysis**
Gyeongmin Do and Jooyeol Rhee
(Gachon University, Korea)

**07 A 6-b 30 MHz Loop unrolled ADC with Multi-bit Comparator**Woo-Suk Shin, Da-Yeon Kim, and Dong-ryeol Oh
(Jeju National University, Korea)

SS02 Energy-Efficient and High-Performance Processors for AI

09:00-10:20

October 28, Tuesday, 2025

Lilac Room (2F)

Chair: Kyuho Jason Lee (Yonsei University)

- 01 DQ-LUT: Dyadic Quantization-Aware LUT-based Approximation for Non-linear Functions in Vision Transformers**
Seokkyu Yoon and Hyun Kim
(Seoul National University of Science and Technology, Korea)
- 02 HEMA-CIM: A Dual-Macro Hybrid-Domain CIM Architecture for Energy-Efficient FP MAC Operations in Edge AI**
Yan Yan^{1,2}, Shaochen Li¹, Wenlun Zhang², Xin Si¹, and Kentaro Yoshioka²
(¹Southeast University, China, ²Keio University, Japan)
- 03 Resource-Efficient Wired-Logic DNN Processor Using Mixed-Precision Quantization Strategy**
Yuxuan Pan, Mototsugu Hamada, and Atsutake Kosuge
(The University of Tokyo, Japan)
- 04 An Accurate AI Accelerator with Heterogeneous Core Architecture for Generative AI Acceleration**
Donghyeon Han
(Chung-Ang University, Korea)
- 05 A Unified Processing Unit Architecture for Accelerating Quantized Large Language Models with Various Precision Levels**
Hyeonseong Kim, Jiyeon Han, and Seungkyu Choi
(Kyung Hee University, Korea)

SS03 Energy-Efficient AI Semiconductor Technologies

09:00-10:20 October 28, Tuesday, 2025

Tulip Room (2F)

Chair: Min-Seong Choo (Hanyang University)

- 01 Gate Insulator Stack Engineering for Fully CMOS-Compatible Reservoir Computing**
Joon Hwang¹, Joonhyung Cho¹, and Min-Kyu Park²
(¹Seoul National University, Korea, ²Gachon University, Korea)
- 02 Defect-Related Transient Responses of Ferroelectric Memory and Their Application**
Haeusung Kim¹, Yubin Choi², Ha-Neul Lee², Hyejin², and Jong-Ho Bae³
(¹Purdue University, USA, ²Kookmin University, Korea, ³Yonsei University, Korea)
- 03 Flash-Gated Thyristors for Energy-Efficient Computing System**
Sung Yun¹, Nagyeong Choi², and Dongseok Kwon³
(¹Kyungpook National University, Korea, ²Seoul National University, Korea, ³GIST, Korea)
- 04 High-Density Synaptic Array Based on Nonvolatile Memory Devices for Energy-Efficient Neuromorphic Systems**
Hyoseob Kim, Suhan Kim, and Min-Hwi Kim
(Chung-Ang University, Korea)
- 05 3D n-Capacitor-Stacked FeRAM for Nonvolatile DRAM**
Sihyun Kim, Kihoon Kim, Hyeokjun You, and Seungmin Kang
(Sogang University, Korea)
- 06 Computing-in-Memory Hardware Based on Flash Memory Synapses and Positive Feedback Neuron Devices**
Dongseok Kwon¹ and Sung Yun Woo²
(¹GIST, Korea, ²Kyungpook National University, Korea)

SS04 Hyperconnectivity for 6G and beyond

09:00-10:20 October 29, Wednesday, 2025

Rose Room (2F)

Chair: Hyun Jong Yang (Seoul National University)

- 01 Error Correction Code Acceleration in Future RAN: Challenges and Opportunities**
Minwoo Kim¹ and Hyun Jong Yang²
(¹POSTECH, Korea, ²Seoul National University, Korea)

**02 GPU-based Pricing Scheduler for Joint User Association and Resource Allocation in MU-MIMO**Minjae Lee, Seongjin Hwang, and Hyun Jong Yang
(Seoul National University, Korea)**03 RT-AUGGAN: Robust Fingerprint Positioning under Environmental Variations via Ray Tracing-Assisted GAN Augmentation**Jaehyun Choi¹, Sehyun Ryu^{1,2}, Seungmin Choi¹, and Hyun Jong Yang¹
(¹Seoul National University, Korea, ²POSTECH, Korea)**04 A Survey on Robust Deep Joint Source-Channel Coding for Task-Oriented Semantic Communications**Eunhye Hong, Taewoo Park, and Yongjune Kim
(POSTECH, Korea)**05 DRL-based Controlled Barrage Region Optimization in Barrage Relay Networks**Yerin Lee, Bang Chul Jung, and Howon Lee
(Ajou University, Korea)**06 Digital Over-the-Air Computation with Space-Time Codes for 6G Massive IoT Networks**Saebom Kim¹, Young-Seok Lee², and Bang Chul Jung²
(¹Chungnam National University, Korea, ²Ajou University, Korea)

SS05 Generative AI for Computer Vision Problems

09:00-10:20

October 28, Tuesday, 2025

Cosmos Room (2F)

Chair: Hongki Lim (Inha University)

- 01 Trust-Region Diffusion with Entropic Constraints for Zero-Shot Inverse Problems**
Seungwon Lee¹, Hwan Lee², and Hongki Lim²
(¹Boston Children's Hospital, USA, ²Inha University, Korea)
- 02 Robust 3D Human Avatar Reconstruction From Monocular Videos Using Depth Optimization and Camera Pose Estimation**
Kyung-Min Kim, Hae-Won Hwang, and Byung-Cheol Song
(Inha University, Korea)
- 03 Lightweight Image Super-Resolution via Progressive Pruning and Adaptive Distillation**
Jeonghyeok Park and Byung Cheol Song
(Inha University, Korea)

04 Depth-map guided 3D point cloud reconstruction

Seunghyeok Shin, Dabin Kim, and Hongki Lim
(Inha University, Korea)

05 Impression based Radiology Report Generation via Reinforcement Learning and Structured Clinical Reasoning

KyeongKyu Lee, Seonghwan Yoon, and Hongki Lim
(Inha University, Korea)

06 Solving Blind Inverse Problems with Diffusion Models via Learned Optimal Transport Maps

Seungwon Lee¹, Minwoo Kim², and Hongki Lim²
(¹Boston Children's Hospital, USA, ²Inha University, Korea)

07 Probabilistic Medical Image Segmentation using Score Entropy Discrete Diffusion Models

Seunghyeok Shin and Hongki Lim
(Inha University, Korea)

SS06**Low-Power Intelligent Biomedical Circuits and Systems**

09:00-10:20

October 29, Wednesday, 2025

Tulip Room (2F)

Chair: Minkyu Je (KAIST), Jerald Yoo (Seoul National University)

01 A 600mVPP-Input-Range 94.5dB-SNDR NS-SARNested DSM with 4th-Order Truncation-Error Shaping and Input-Impedance Boosting for Neural recording

Kyeongwon Jeong¹, Heewon Choe², Sohyung Ha³, and Minkyu Je²
(¹ETH Zurich, Switzerland, ²KAIST, Korea, ³NYU Abu Dhabi, UAE)

02 A Reconfigurable Ising Machine for Scalable Combinatorial Optimization Problems

Yingna Huang¹, Zhongqi Li², Jiaer Chen², and Jerald Yoo²
(¹National University of Singapore, Singapore, ²Seoul National University, Korea)

03 Body-Coupled Powering and Ambient Energy Harvesting System for Wearable Devices

Zhuoyue Li¹, Kyungsoo Park², Gwangjin Kim², Donghan Kim², and Jerald Yoo²
(¹National University of Singapore, Singapore, ²Seoul National University, Korea)

04 A Wide Input Range Noise-Shaping Pipelined-SAR ADC with Self-Boosted Input Impedance and Reused Amplifier for Biosignal Acquisition

Rucheng Jiang¹, Jihye Park², Hyunseung Lee², Jinhong Ahn², and Jerald Yoo²
(¹National University of Singapore, Singapore, ²Seoul National University, Korea)

**05 A Low-Power Multimodal Biosensor Interface IC for Wireless Motion-Intention Recognition in Wearable Robots**

Yoonae Jung¹, Haidam Choi², Jimin Koo², Ji-Hoon Suh¹, Sein Oh⁴, and Minkyu Je²
(¹imec, Belgium, ²KAIST, Korea, ³University of California San Diego, USA, ⁴Alphacore, USA)

SS07**High-speed Communication Circuits and Systems**

15:00-16:20

October 28, Tuesday, 2025

Lilac Room (2F)

Chair: Gain Kim (DGIST), Kwansoo Park (Yonsei University)

01 Approximation of Cross Correlation for Energy-Efficient Synchronization of Discrete Multitone Wireline Transceivers

Jaewon Lee^{1,2}, Pier-Andrea Francesc¹, Korkut Kaan Tokgoz³, Seoyoung Jang^{1,4}, Gayoung Kang⁴, Yoonji Choi⁴, Gain Kim^{1,4}
(¹IBM Research Europe, Switzerland, ²ETH Zurich, Switzerland, ³Sabancı University, Türkiye, ⁴DGIST, Korea)

02 Reconfigurable DSP-based Transmitter Supporting PAM-2/4/8 with 14-Tap Feedforward Equalization

Gyu-Seob Jeong¹, Woorham Bae¹, Seung-Mo Jin², Dong-Ho Kim², Seung-Hwan Gong², Jae-Geon Lee², Dong-Hyun Lee², Jae-Hyeon Pyeon², In-Ho Han², and Min-Seong Choo²
(¹Ayar Labs, USA, ²Hanyang University, Korea)

03 Wide Range PI-Based CDR With a Direct Proportional Path and an IIR Filter in 28-nm CMOS

Gyu-Seob Jeong, Woorham Bae, Seung-Mo Jin, Dong-Ho Kim, Seung-Hwan Gong, Jae-Geon Lee, Dong-Hyun Lee, Jae-Hyeon Pyeon, In-Ho Han, and Min-Seong Choo
(Hanyang University, Korea)

04 Modeling and Simulation of Mueller-Muller Clock Data Recovery System for PAM-4 Wireline Transceivers

Seongjin Kim¹, Korkut Kaan Tokgoz², and Gain Kim¹
(¹DGIST, Korea, ²Sabancı University, Türkiye)

05 Fast and Accurate SystemVerilog Framework for Mixed-Signal Modeling of PAM-4 Wireline Transceivers

Yujin Choi¹, Yusuf Leblebici², and Gain Kim¹
(¹DGIST, Korea, ²Sabancı University, Türkiye)

SS08**Highlights of AI Research Achievements by Inha University's BK21 Program**

13:30-14:50

October 28, Tuesday, 2025

Rose Room (2F)

Chair: Byung Cheol Song (Inha University)

01 Enabling Weak Client Participation via On-device Knowledge Distillation in Heterogenous Federated Learning

Jihyun Lim¹, Junhyuk Jo¹, Tuo Zhang², and Sunwoo Lee¹
(¹Inha University, Korea, ²University of Southern California, USA)

02 All You Need is Your Voice: Emotional Face Representation with Audio Perspective for Emotional Talking Face Generation

Seongho Kim, Seongmin Kim, Yeong Min Lee, and Byung Cheol Song
(Inha University, Korea)

03 MECA: Manipulation With Emotional Intensity-Aware Contrastive Learning and Attention-Based Discriminative Learning

Seong-Ho Kim, Hae-Won Hwang, and Byung Cheol Song
(Inha University, Korea)

04 Two is Better than One: Efficient Ensemble Defense for Robust and Compact Models

Yujin Jung, Minju Hyun, Seong Min Kim, and Byung Cheol Song
(Inha University, Korea)

05 Two is Better than One: Efficient Ensemble Defense for Robust and Compact Models

Yujin Jung, Minju Hyun, Seong Min Kim, and Byung Cheol Song
(Inha University, Korea)

06 Integration of Electric Vehicles as Non-Wires Alternatives: A Virtual Power Line Approach

Yeongsang Lee¹, Seoeun Rho¹, Jaewon Lee², and Dongjun Won¹
(¹Inha University, Korea, ²Hyundai Mobis Co., Ltd., Korea)

07 M2SFormer: Multi-Spectral and Multi-Scale Attention with Edge-Aware Difficulty Guidance for Image Forgery Localization

Ju-Hyeon Nam, Dong-Hyun Moon, and Sang-Chul Lee
(Inha University, Korea)

08 Draw Your Mind: Personalized Generation via Condition-Level Modeling in Text-to-Image Diffusion Models

Hyunjin Kim, Seokho Ahn, and Young-Duk Seo
(Inha University, Korea)

**09 Lossless Token Merging Even Without Fine-Tuning in Vision Transformers**

Jaeyoon Lee, Seongsoo Heo, and Dong-Wan Choi
(Inha University, Korea)

10 Optimizing Intersection Navigation with Multi-Shot Update Mechanism: A Real-Time Distributed Reinforcement Learning for Ground and Aerial Moving Objects

Qin Yang and Sang-jo Yoo
(Inha University, Korea)

SS09**Quantum Algorithms: From Modeling to Execution by KETI**

15:00-16:20

October 28, Tuesday, 2025

Rose Room (2F)

Chair: Byung-Soo Kim (KETI), Yunpyo Hong (KETI)

01 Enabling Realistic Clifford+T Communication in the Surface Code with Magic-State Factories

Sunghye Park
(Ajou University, Korea)

02 Resource-Efficient Simulation of Large Quantum Circuits Using Circuit Partitioning and Qubit Reuse

Leanghok Hour, Muyleang Ing, and Youngsun Han
(Pukyong National University, Korea)

03 A Review of Quantum Supremacy in QUBO-Based Applications

Arim Ryou, Kiwoong Kim, and Kyungtaek Jun
(Chungbuk National University, Korea)

04 Rethinking Deep Neural Network Algorithms in Quantum Hilbert Spaces

Joongheon Kim
(Korea University, Korea)

05 Smart Insert Layerwise learning QAQA for solving MaxCut problem

Jaewon Gill, Yunpyo Hong, and Byung-Soo Kim
(KETI, Korea)

SS10 SNU Graduate School of AI Semiconductor

13:30~14:50

October 28, Tuesday, 2025

Lilac Room (2F)

Chair: Hyuk-Jae Lee (Seoul National University), Hangi Park (Seoul National University)

- 01 A High-PSR LDO Using a Body-Injected Supply-Ripple Cancellation Technique in DRAM Interfaces**
Hyunjun Song¹, Jaeho Kim¹, Myeongho Han¹, Younghyun Lim², and Jaehyook Choi¹
(¹Seoul National University, Korea, ²Kyung Hee University, Korea)
- 02 Low Jitter and Low Spur Fractional-N Sampling PLL Using a Nonlinearity-Replication Technique**
Junseok Lee, Yuhwan Shin, Jeongbeom Seo, Hojun Jeon, and Jaehyook Choi
(Seoul National University, Korea)
- 03 A Frequency Synthesizer Based on a Subsampling PLL with Harmonic-Extractor**
Seohyeon Kwak, Seohye Jung, Sarang Lee, and Jaehyook Choi
(Seoul National University, Korea)
- 04 Efficient Privacy-Preserving Federated Learning with Sensitivity-Based Selective Homomorphic Encryption**
Yewon Jeong and Woo-Seok Choi
(Seoul National University, Korea)

SS11 Human Level Robot Interaction

09:00~10:20

October 29, Wednesday, 2025

Cosmos Room (2F)

Chair: Sung Soo Hwang (Handong Global University)

- 01 EEG-based Brain-Robot Interface**
Junhyeok Choi, Inbae Park, Eunhye Park, Keonhee Lee, Nanum Jeong, Yoseph Cho, Wonjin Kim, Sion Kim, Youngjun Jeong, Haeun Sung, and Minkyu Ahn
(Handong Global University, Korea)
- 02 Agent Orchestration Architecture for Human Level Robot Intelligence**
Hahyun Baek, Jikwang Lee, Yunmin Go, and Jaechang Nam
(Handong Global University, Korea)

**03 Real-Time User-Adaptive AI Fitness Robot**GukIn Cheon and WonHyong Lee
(Handong Global University, Korea)**04 Vision-Based Self-Driving Robot Simulation via 3D Gaussian Splatting**Jong Hun Won, Ha Young Kim, Seo Youn Park, Yo Han Kim, Sung Min Kim, Seong Hwan Sim, Hyun Woo Gu, and Sung Soo Hwang
(Handong Global University, Korea)**05 Text-based Indoor Robot Navigation with an RGB-D Camera**Do Hyun Kwak, Ha Jin Kim, Hui Jae Mun, Min Seok Lee, Sun Gyu Han, Seung Hun Hyeon, Hyun Seo Lee, Gun Min Yoo, and Sung Soo Hwang
(Handong Global University, Korea)**06 End-effector Driven mobile manipulator control**Ji-Wook Kwon
(Korea Institute of Robotics & Technology Convergence, Korea)**07 A Hierarchical Service Architecture for Humanoids: Toward General-Purpose Robot Intelligence**SEOHEE CHOI and JINSOON JEON
(CLOBOT Co., Ltd., Korea)

Oral Sessions

OS01 Smart City CE and AI Applications

16:30~17:50

October 28, Tuesday, 2025

Rose Room (2F)

Chair: Min-Seong Choo (Hanyang University)

- 01 Next Buy Navigator: Smart Shopping Cart with Item Prediction**
Jonathan Simon D. Bernado¹, Gena Lyn L. Tusi¹, I Elizabeth Cha², Yong-Xiang Chen², and Jan Kevin A. Galicia³
(¹Ateneo de Manila University, Philippines, ²Chung Yuan Christian University, Taiwan, ³Ateneo de Manila University, Philippines)
- 02 CAPE++: Class-wise Concept Probability and Regularization for Enhanced DNN Interpretability**
Kyuhoon Moon, Seungin Baek, and Jitae Shin
(Sungkyunkwan University, Korea)
- 03 Runtime Noise Robust Edge Inference with Incremental Learning and Partial Update using FPGA Accelerator**
Myeongjin Kang and Daejin Park
(Kyungpook National University, Korea)
- 04 Efficient Voice Phishing Detection using the Agentic AI Approach**
Sungsoo Kim
(ETRI, Korea)
- 05 A Modular VLA for Autonomous Driving: Evaluating VLM Performance and Safety**
Young Hoon Suh, Eun Ho Kim, Yeong Gwang Choi, Hyo Gin Park, Hye Hyeon Park, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 06 An FPGA-Based Integrated Post-Processing Accelerator for YOLACT in Autonomous Driving**
HyeonJin Sim, Gyu Hyeon Hwang, HoBin Oh, Min Kwon Choi, Seung Wook Oh, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 07 Frequency Modulating Networks: Parameter-Efficient Spectral Refinement at Image and Feature Levels**
Jungwoo Bae, Minseon Park, and Jitae Shin
(Sungkyunkwan University, Korea)



OS02 AI-Enhanced Consumer Electronics

16:30~17:50

October 28, Tuesday, 2025

Lilac Room (2F)

Chair: Kyuho Jason Lee (Yonsei University)

01 TAPAS: A Case Study on Topology Aware Multi-PIM in Model ParallelismYun Seok Kim and Won Woo Ro
(Yonsei University, Korea)**02 A Study on Improving the Performance of Contact Centers' Speech Recognition Using Simulated Data**Huiyong Bak¹ and Jonghwan Na²
(¹LOTTE INNOVATE, Korea, ²Inha University, Korea)**03 A Performance Study of LLM Inference on Mooncake-Based Clusters**Jungeun Yoon, Hooyoung Ahn, Sookwang Lee, Kyungmin Kim, HunSoon Lee, Junhyeok Park, and Shinyoung Ahn
(ETRI, Korea)**04 Smart Financial Decision-Making System**Assel Mukasheva¹, Almas Saduakas¹, Alibek Bisembayev¹, Dina Koishiyeva¹, and Jeong Won Kang²
(¹Kazakh-British Technical University, Kazakhstan, ²Korea National University of Transportation, Korea)**05 Enhancing End-to-End Autonomous Driving through Loss Function Optimization**Hyojin Park, HyeonKcun Hong, YeongGwang Choi, Eunho Kim, Young Hoon Suh, and Jae Wook Jeon
(Sungkyunkwan University, Korea)**06 The Effect of Age Congruence Between Vocal Timbre and Visual Persona on Perceived Attractiveness in Singing-Voice Synthesis Software**Po-Yu, Chen and Chien-Wen Cheng
(National Taipei University of Technology, Taiwan)

OS03 AI/ML for Consumer Electronics and Smart Mobility

16:30~17:50

October 28, Tuesday, 2025

Tulip Room (2F)

Chair: Gain Kiam (DGIST)

- 01 **Structure Reorganization of Zipformer for Automatic Speech Recognition**
Chao-Hsien Lee and Min-Rui Luo
(*National Taipei University of Technology, Taiwan*)
- 02 **Performance Analysis of Convolutional Architectures for Image Pattern Recognition**
Assel Mukasheva¹, Dina Koishiyeva¹, Almas Saduakas¹, and Jeong Won Kang²
(¹*Kazakh-British Technical University, Kazakhstan*, ²*Korea National University of Transportation, Korea*)
- 03 **Visual-Audio Fusion in Deep Learning for Music Genre Classification**
Che-Yen Huang and I Elizabeth Cha
(*Chung Yuan Christian University, Taiwan*)
- 04 **Realistic Contaminant Image Synthesis using SPADE and Generative Label Synthesis**
Mun Byeong-II, Cho Yong-Hyeon, Park Jin-Man, Lee Seon-Yeong, Min Kyoung-Won, and Son Haeng-Seon
(*KETI, Korea*)
- 05 **Design of an Automotive OTA System with Zonal Gateways and PQC-Hybrid TLS**
Jiseong Chung, Sungkwon Park, and Songnam Hong
(*Hanyang University, Korea*)
- 06 **Exploring Control of Speed Perception in Driving Simulator by Vection using Tactile Stimulation**
Kei Arai¹, Tomokazu Furuya¹, Juntaro Sakazaki², Naoki Hiyoshi², Sota Hiroaki², and Takahiro Higuchi²
(¹*Tokyo Metropolitan College of Industrial Technology, Japan*, ²*Tokyo Metropolitan University, Japan*)
- 07 **CLIP-based Chest X-ray Anomaly Detection**
Seungin Back, Kyuhoon Moon, and Jitae Shin
(*Sungkyunkwan University, Korea*)



OS04 Human-Centered CE: Sensing, Interaction, and Immersive Experiences

16:30~17:50

October 28, Tuesday, 2025

Cosmos Room (2F)

Chair: Joo-Hyung Chae (Kwangju University)

- 01 **Increasing Learning Data by Using Audio Data Augmentation for Bat Swing Motion Classification with Acceleration Sensor**
Yuichi Yakiyama¹, Koki Yamada¹, Toshimitsu Honda¹, Kohei Miyase¹, Stefan Holst¹, Shudai Ishikawa², Roshwin Sengupta¹, and Ilia Polian³
(¹*Kyushu Institute of Technology, Japan*, ²*National Institute of Technology Oita College, Japan*, ³*University of Stuttgart, Germany*)
- 02 **Wearable Pulsatile Compression Devices During Intradialytic Promote Individual Quality of Life in Chronic Kidney Disease Patients**
ChunKeung Chau¹, ChuanChia Wang¹, Chen Han¹, KengWei Liu¹, JwoShiun Sun¹, and TungJing Fang²
(¹*National Taipei University of Technology, Taiwan*, ²*National Taipei University of Technology / National Defense Medical Center, Taiwan*)
- 03 **Assessing Early-Childhood Education Apps with Nielsen Heuristics and Contextual Extensions**
Jing Lin¹, LinJi Li¹, and Jun He²
(¹*Kyung Hee University, Korea*, ²*Fuzhou University, China*)
- 04 **A Multimodal Room Reader Assistant for Emotion-Adaptive and Context-Aware Procurement Negotiation Training**
Yong-Xiang Chen¹, Huan-Hsun Chen¹, Chih-Yao Yu¹, and Hsin-I Chen²
(¹*Chung Yuan Christian University, Taiwan*, ²*Chi Mei Medical Center, Taiwan*)
- 05 **Immersive Social Experiences in a Space-Based Metaverse SNS: User Experience with Platform-Specific Interactions on PC and VR**
Yeon Woo Kim, Bo Hyeon Kim, Min Ju Kim, and Young Ju Jeong
(*Sookmyung Women's University, Korea*)
- 06 **AI-Assisted Music Therapy Intervention for Alleviating Exam Anxiety in University Students: System Design, Implementation, and Efficacy Evaluation**
Xiaoyi Song¹, Jie Zheng², and Jun He¹
(¹*Fuzhou University, China*, ²*Xiamen Institute of Technology, China*)

OS05 Advances in Entertainment, Gaming, and XR Technologies

09:00~10:20

October 29, Wednesday, 2025

Rose Room (2F)

Chair: Younghyun Lim (Kyung Hee University)

- 01 **The Impact of Collection Mechanisms on Player Experience in Puzzle Games**
Qingyun Lin, Chanyuan Yan, Xiaoyi Song, and Jun He
(*Fuzhou University, China*)
- 02 **Learning Gas Laws with HoloAir: A VR Educational Tool for the Ideal Gas Equation**
Toshiki Hamaoka¹, Tatsuro Ueda², and Kazuhisa Nakasho³
(¹*Yamaguchi University, Japan*, ²*Feel Physics, Japan*, ³*Iwate Prefectural University, Japan*)
- 03 **Real-time Fighting Game Commentary Generation via Strategic Rationale Distillation**
Boyu Chuang, Menghan Zhang, Thai Van Nguyen, Yiyang Liu, and Ruck Thawonmas
(*Ritsumeikan University, Japan*)
- 04 **Research on the Weight Design of Gestalt Principles in the Interface of Smartphone Puzzle Games**
Xin Zheng, Yue Cao, Zheng Lin, and Jun He
(*Fuzhou University, China*)
- 05 **Application of the Fogg Behavior Model in Adventure Game Interaction Design**
Yue Cao, Xin Zheng, and Jun He
(*Fuzhou University, China*)
- 06 **An Empirical Study on Game Prop Design: A Node-Based Generative Workflow in ComfyUI**
ShanXin Deng, ZhiYun Ye, and Jun He
(*Fuzhou University, China*)



OS06 Next-Generation IoT Applications for Smart CE

10:30~12:00

October 29, Wednesday, 2025

Rose Room (2F)

Chair: Minsuk Koo (University of Seoul)

- 01 **Design and Implementation of IoT Device and Service Search Platform Using LwM2M Gateway**
Seiya Komonguchi, Ryosei Takaki, and Hidekazu Suzuki
(*Meijo University, Japan*)
- 02 **Hybrid Optimization-Rule Framework for Real-Time Job Shop Co-Scheduling**
Doyoung Kim, Woojin Jun, KyeongMin Yeom, and Moon Gi Seok
(*Dongguk University, Korea*)
- 03 **Evaluation of Automatic Garbage Detection System Using Camera and Low-Power Edge Device**
Tatsuya Abe and Hidekazu Suzuki
(*Meijo University, Japan*)
- 04 **Proposal of an Information Delivery Method for Electronic Paper Signage Using Human Mobility as the Communication Medium**
Takafumi Akiba and Tsubasa Yumura
(*Hokkaido Information University, Japan*)
- 05 **Mobility-Aware Federated Offloading via Reinforcement Learning: Reliable and Energy-Fair Edge Intelligence**
Woojin Jun, Doyoung Kim, and Moon Gi Seok
(*Dongguk University, Korea*)
- 06 **Enhancing Test-Time Training for Corruption Robustness in Image Classification**
Minseon Park, Jungwoo Bae, and Jitae Shin
(*Sungkyunkwan University, Korea*)

OS07 Wireless, Networked, and Emerging CE Technologies

10:30~12:00

October 29, Wednesday, 2025

Lilac Room (2F)

Chair: Min-Jae Seo (University of Seoul)

- 01 Performance Evaluation of the "Tsurugi" Database for Real-Time Factory Data Ingestion**
Mito Yamada and Mikiko Sode Tanaka
(National Institute of Technology, Niihama College, Japan)
- 02 Angle-Aware mmWave MISO Wireless Sensing for Vibration Frequency Estimation**
Che-Yao Lee, Pei-Tsen Hsieh, Yu-Chieh Chen, Tzu-Hsiang Hsu, and Meng-Lin Ku
(National Central University, Taiwan)
- 03 A Flexible and Stretchable Rectenna Based on Interlocked Serpentine for RF Energy Harvesting**
Ze-Hui Chen¹, Hong-Tu Qu¹, Hao Chen¹, Lu-Yang Sun¹, Tian Liu¹, and Wei-Bing Lu^{1,2}
(¹Southeast University, China, ²Purple Mountain Laboratories, China)
- 04 A High-Precision Ku-band Passive Vector Phase Shifter with 360° Phase Tunability for satellite communications**
Wanfu Liu and Jianhui Wu
(Southeast University, China)
- 05 Terahertz Transmitter Frontend Using Multi-Port Varactors in 65-nm CMOS**
Saad Azmeem-ur-Rahman¹, Young-Joon Lee², and Wooyeol Choi²
(¹Oklahoma State University, USA, ²Seoul National University, Korea)
- 06 Path-Based Correlation Analysis of Meteorological Factors and eLoran Signal Delay Variations**
Junwoo Song¹ and Pyo-Woong Son²
(¹Yonsei University, Korea, ²Chungbuk National University, Korea)



OS08 Automation, Drones, and Secure CE Applications

10:30~12:00

October 29, Wednesday, 2025

Tulip Room (2F)

Chair: Hyun Jong Yang (Seoul National University)

- 01 Corner Point-based Calibration Technique for QR Code Readers in Robot Localization**
Minsuh Song¹, YeongJe Im¹, Sunwon Jang¹, Soohun Kim¹, Seunghyuk Back², Kunjin Ryu², Changeun Gwak², and Suk-Ju Kang²
(¹Sogang University, Korea, ²Samsung Electronics Co., Ltd., Korea)
- 02 Motion-Aware Spectral Analysis (MASA): Bridging Robot-Induced Motion Artifacts and CNN Spectral Responses**
Youjin Kim, Sungjae Jeon, Seungtae Hong, and Jeong-Si Kim
(ETRI, Korea)
- 03 Development of a Low-Cost Real-Time Crop Detection System Using SSD-Based Deep Learning on a Compact UAV**
Daichi Yodoshi and Shun Nishide
(Kyoto Tachibana University, Japan)
- 04 Performance Analysis of DWB, MPPI, and Regulated Pure Pursuit, Rotate Shim for ROS2-Based AMR Navigation on Simulation**
Kyung Hoon Kim^{1,2}, Jin Suk Lee³, and Jae Wook Jeon¹
(¹Sungkyunkwan University, Korea, ²Samsung Institution of Technology, Korea, ³Samsung Display Co., Ltd., Korea)
- 05 ZTHA: A Zero Trust Hypervisor Architecture for Software-Defined Vehicle HPC**
Seong Hyeon Lim, Sung Bhin Oh, Young Soo Do, Young Min Kim, Beom Gi Suh, Chae Eun Lee, Kyung Dong Kwon, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 06 A Lightweight and Secure One-time Authentication Protocol for MQTT based on SAS-L2**
Ryoya Nakamura¹, Senling Wang¹, Hiroshi Kai¹, Hiroshi Takahashi¹, and Akihiro Shimizu²
(¹Ehime University, Japan, ²Kochi University of Technology, Japan)
- 07 A Method for Creating Rules for IPS and IDS Based on Test-driven Development and Proof-of-Concept Code**
Yudai Yamamoto and Shingo Yamaguchi
(Yamaguchi University, Japan)

OS09 Core Consumer Electronics Technologies

10:30~12:00

October 29, Wednesday, 2025

Cosmos Room (2F)

Chair: Ji-Hoon Kim (Hanyang University)

- 01 Chronological White-Hat Worm Launcher using Reinforcement Deep Learning**
Sena Yoshioka¹, Shingo Yamaguchi¹, and Mohd Hafizuddin Bin Kamilin²
(¹Yamaguchi University, Japan, ²National Institute of Technology, Ube College, Japan)
- 02 DBAR: Dynamic Bank Allocation and Renaming for NoC-aware Memory Management in NPUs**
Inkyo Lee and Jeongwoo Park
(Sungkyunkwan University, Korea)
- 03 Dynamic Offloading Optimization for Multi-PIM LLM Inference**
Jeong Yoon Kang, Jae Hyung Ko, Taeho Hwang, and Kyu Hyun Choi
(KETI, Korea)
- 04 Approximate TMR-Based Six-Module High-Reliability Architecture for Sensor Data Processing**
Seongmin Choi, Kyeongmook Oh, Jeahack Lee, and Byung-Soo Kim
(KETI, Korea)
- 05 High Responsivity NiO Metal-Semiconductor-Metal Photodetectors with Dielectric/Metal/Dielectric Transparent Conducting Electrode**
Jun-Dar Hwang and Yi-Rong Liou
(National Chiayi University, Taiwan)
- 06 A Hybrid Wireless Power Transfer System with Two Concentric Coils for Mobile Applications**
Jo Iwabuchi¹, Koutaro Hachiya², and Atsushi Kurokawa¹
(¹Hirotsuki University, Japan, ²Teikyo Heisei University, Japan)
- 07 Mobile App for Motion Analysis in Gymnastics**
Shiela M. Cabahug, Ardhika Maulidani, and Yuan-Hsiang Lin
(National Taiwan University of Science and Technology, Taiwan)



Poster Sessions

PS1 Poster Session 1 - SNU

09:00~10:20

October 28, Tuesday, 2025

Grand Ballroom B (1F)

Chair: Chanwoong Hwang (Seoul National University)

- 01 Unitary Synthesis using Gflownets**
Inhoe Koo
(Seoul National University, Korea)
- 02 Hybrid PID-PWM Fan Control for Sound- Constrained Environment**
Junu Kwon
(Seoul National University, Korea)
- 03 Development of High-Efficiency WBG PSCs through Enhanced Phase Purity in FA-Based 2D RP Perovskite Solar Cells**
Kun woo Kim
(Seoul National University, Korea)
- 04 Beyond Next Token Prediction: A Performance Characterization of Diffusion versus Autoregressive Language Models**
Minseo Kim¹, Coleman Hooper², Aditya Tomar², Chenfeng Xu^{2,5}, Michael W. Mahoney^{2,3,4}, Kurt Keutzer², and Amir Gholami^{2,3}
(¹Seoul National University, Korea, ²University of California Berkeley, USA, ³ICSI, USA, ⁴LBL, USA, ⁵University of Texas at Austin, USA)
- 05 Statistical Analysis of Floating Channel Potential Growth During GIDL-Assisted Erase in 3-D NAND Flash Memory**
Sungju Kim¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 06 Fabrication of Two-Dimensional Metal Electrodes with Low Contact Resistance for 2D Semiconductor**
Transistors Gyeongmo Park, Jaewoong Joo, and Gwan-Hyoung Lee
(Seoul National University, Korea)

- 07 Exploring the Thermal Transport in 2D materials using Transient Grating Spectroscopy**
Leo Park, Hyunseok Oh, and Taeyong Kim
(Seoul National University, Korea)
- 08 Processing fMRI Brain Signals Using Latents from Natural Image Autoencoders**
Juhyeon Park, Peter Yongho Kim, Jungwoo Park, Jubin Choi, Jungho Seo, Jiook Cha, and Taesup Moon
(Seoul National University, Korea)
- 09 Advanced Microfluidic Cooling Solutions for High-Bandwidth Memory in 3D Packaging**
Jeonghwan Park
(Seoul National University, Korea)
- 10 BiCQL-ML: A Bi-Level Conservative Q-Learning Framework for Maximum Likelihood Inverse Reinforcement Learning**
Junsung Park
(Seoul National University, Korea)
- 11 Enhancing ferroelectric properties of Zr-doped HfO₂ thin films using the bi-layer bottom electrode structures**
Han Sol Park and Cheol Seong Hwang
(Seoul National University, Korea)
- 12 ICCE-Asia 2025 Poster Inhibitor-Engineered Area-Selective ALD for HKMG Integration in GAAFETs**
Yonghyun Bae, Junghwan Park, Chaeun Lee, Yoonsang Hwang, and Junwoo Son
(Seoul National University, Korea)
- 13 Video Transformer for Viscosity Prediction of Fluid Mixing Processes with CFD Data Augmentation**
Jongwon Sohn, Juhyeon Moon, and Jaewook Nam
(Seoul National University, Korea)
- 14 Cell Variation Induced Vth Distribution Degradation in Z-Interference of 3-D NAND Flash Memory**
Sangmin Ahn¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 15 Comparative study of Application of Al_{0.85}Si_{0.2}N in Silicon-based Ferroelectric Field Effect Transistor for Large Memory Window**
Min Kyu Yeom and Cheol Seong Hwang
(Seoul National University, Korea)



- 16 Evidence of metastable state in kagome metals using X-ray free electron laser**
M. G. Kang¹, S. Y. Lee², J. M. Kim², S. H. Ryu², H. Y. Jang², G. B. Kang¹, C. J. Won², B. Ortiz¹, and S. H. Oh¹
(¹Seoul National University, Korea, ²POSTECH, Korea, ³Oak Ridge National Laboratory, USA)
- 17 Machine Learning-Based Prediction of Random Telegraph Noise Induced Threshold Voltage Variability in 3D NAND Flash Memory**
Eunseok Oh¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 18 Layer-Selective Oxidation-Induced Compressive Strain and Inter-Layer Decoupling in WS₂ Bilayer FETs**
Ingyu Woo, Chulmin Kim, and Chulho Lee
(Seoul National University, Korea)
- 19 Subsolidus phase diagrams of the In₂O₃-SnO₂-ZnO system at 1400 and 1500°C and new ternary In₂Sn₂Zn₂O₉ phase**
Kyungmin Yu
(Seoul National University, Korea)
- 20 A Physical Modeling of Lateral Charge Loss in 3-D NAND Flash Memories via Finite Element Method (FEM)-Based Simulations**
Jinil Yoo¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 21 TBPDN: Tiny Bad Pixel Detection Network**
Geonha Lee
(Seoul National University, Korea)
- 22 Single-Point Threshold Voltage Sensing for 3-D NAND Flash Memory Re-Program State Classification**
Dogyong Lee¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 23 Scalable projected entangled-pair state representation of random quantum circuit states**
Sung-Bin B. Lee, Hee Ryang Choi, Daniel Donghyon Ohm, and Seung-Sup B. Lee
(Seoul National University, Korea)
- 24 Investigation of Z-interference Effect in V_{th} Distribution of 3D NAND Flash Memory and Mitigation using Reprogram Scheme**
Jooyoung Lee¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)

- 25 Automated Vulnerability Patch Generation using LLM**
Juenkyu Lee, Yungi Cho, Wooreum Han, and Yunheung Park
(Seoul National University, Korea)
- 26 Prediction of Threshold Voltage Distribution Degradation Using Statistical Method**
Chan Lee¹ and Hyeonchul Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 27 Analysis and Modeling of Layout Dependent Effects Induced by Surrounding STI in Practical Layout Patterns**
Dongwoo Lim¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 28 Erase Characteristics of 3D MONOS Charge-Trap NAND Flash Memories: A Compact Modeling Approach**
Changhyeok Im¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 29 An advanced scheme to match cross-coupling between the operations for 3D NAND flash memory**
Jaeyeop Jung¹, Sungju Kim¹, and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 30 Optimization of Interface Circuits for HFGFET Gas Sensors**
Min Woo Cho
(Seoul National University, Korea)
- 31 FEM device modeling for mixed conductor electronic devices**
Yoon Jo, Kyungmin Ko, Yongjin Kim, Dohyun Kim, and Keehoon Kang
(Seoul National University, Korea)
- 32 Monolithic 3D Integrated 1TnR Compute-in-Memory Array for Multi-layer Ising Solver**
Jea Min Cho, Sunwoo Cheong, and Cheol Seong Hwang
(Seoul National University, Korea)
- 33 Complete Separation of Electron Tunneling Emission from Bandgap-Engineered Oxide in 3-D NAND Flash Memory**
Myung Jin¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)



- 34 Towards the Use of Layer-to-Layer Stability Patterns for Early Accuracy Estimation in Question Answering**
Minjoon Choi
(Seoul National University, Korea)
- 35 Performance-Guaranteed CSI Feedback via Incremental Residual Compression Framework**
Seungmin Choi and Hyun Jong Yang
(Seoul National University, Korea)
- 36 Modeling for Program Transients of Cylindrical Charge-Trap-Based NAND Flash Memories**
Haechan Choi¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 37 CREAM: Cost-Effective Randomizer for Read Error Mitigation in QLC NAND Flash**
Hoseung Choi, Bo sung An, Yeonsang Shin, and Woo-seok Choi
(Seoul National University, Korea)
- 38 Machine Learning-Based Prediction of Grain Boundary Position Effects on Z-interference in 3-D NAND Flash Memory**
Hwanhee Choi¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 39 A Machine-Learning Approach to Predicting Threshold Voltage Distribution Caused by Lateral Migration in 3-D NAND Flash Memory**
Insang Han¹ and Hyungcheol Shin^{1,2}
(¹Seoul National University, Korea, ²Integra Semiconductor Ltd., Korea)
- 40 Highly conductive polymeric conductors for stretchable electronics**
Yoonsang Hwang, Hyun-Wook Kim, Huanyu Zhou, and Tae-Woo Lee
(Seoul National University, Korea)

PS2

13:30-14:50

October 28, Tuesday, 2025

Grand Ballroom B (1F)

Chair: Min-Hwi Kim (Chung-Ang University)

- 01 Smart Advanced Metering Infrastructure for City Gas Measurement Services**
Jiho Park, Jeonghun Son, and Hoyoung Yoo
(Chungnam National University, Korea)

- 02 Reasoning-augmented Vision-Language Models for Improved Competency in Scene Text Recognition**
Minjae Bang¹, Juhyeon Han², Yuseok Bae³, Sunok Kim², and Kimin Yun^{3,4}
(¹Columbia University, USA, ²Korea Aerospace University, Korea, ³ETRI, Korea, ⁴UST, Korea)
- 03 Communication and Image Analysis Using WiFi HaLow**
Ryuki Ibusuki and Mikiko Sode Tanaka
(National Institute of Technology (KOSEN) Niihama College, Japan)
- 04 Lightweight Dental Image Segmentation with Combined Importance and Redundancy-based Pruning**
Minju Hyun¹, Wan Kim², Jae Hwan Han², Jae hoon Shim², Soon Hyoung Pyo², and Byung Cheol Song¹
(¹Inha University, Korea, ²Ostem Implant Co., Korea)
- 05 A Scalable Continual Learning Framework for Air Conditioner Fault Diagnosis**
Junwon Lee¹, Chaehyeon Lee¹, Minsuk Kwak², Nakhoon Kim², and Heechul Jung¹
(¹Kyungpook National University, Korea, ²LG Electronics Inc., Korea)
- 06 Action Elimination through Hallucination Detection: A Reinforcement Learning Approach for LLM Fine-Tuning**
Jeong Ho Park, Seonjong Kang, Song Jae Lee, Sanga Park, Jia Kim, Jung Hun Jin, and Kyutae Cho
(LIG Nex1 Co., Ltd., Korea)
- 08 Score-Guided Inference in Fixed-Weight SNN using Spike Count and Timing**
Minkyung Kim, Jiho Kim, and Youngmin Kim
(Hongik University, Korea)
- 09 DUAL-VAD: Dual Benchmarks and Anomaly-Focused Sampling for Video Anomaly Detection**
Seotik Jung¹, Taekyung Song¹, Joshua Jordan Daniel², JinYoung Lee², and SungJun Lee¹
(¹PIA-SPACE Inc., Korea, ²Sejong University, Korea)
- 10 Toward Efficient Deployment of Lightweight Object Detectors for Real-Time Inference on Resource-Constrained Edge Devices**
Thaising Taing, Yousufzai Fawad Khan, Hayotjon Aliev, and HyungWon Kim
(Chungbuk National University, Korea)
- 11 Deployable and Explainable Stacked Ensemble for Atrial Fibrillation Detection in Wearable Systems**
Sweetha Malar Robert, Karimov Islom Normurod Ugli, and Shin KyooJae
(Busan University of Foreign Studies, Korea)



- 12 Comparative Analysis of Segmentation Models for RTL-Based Lane Recognition in Autonomous Driving**
Min Kwon Choi, Gyu Hyeon Hwang, HoBin Oh, HyeonJin Sim, Seung Wook Oh, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 13 Excel-in-the-Loop Active Learning on KoMaP for Consumer Electronics Materials, with Extension to Battery Electrode AI Autonomous Manufacturing**
Hyunjong Kim, Suyoung Chi, and Yongkwi Lee
(ETRI, Korea)
- 14 Efficient SLAM Tracking via Significant Gaussian Selection in 3D Gaussian Splatting**
Hyukjun Kweon and Jeongwoo Park
(Sungkyunkwan University, Korea)
- 16 CIPHER: Counterfeit Image Pattern High-level Examination via Representation for GAN and Diffusion Discriminator Learning**
Kyeonghun Kim¹, Youngung Han¹, SeoYoung Ju¹, YeonJu Jean¹, YooHyun Kim¹, Minseo Choi¹, SuYeon Lim¹, Kyungtae Park¹, Seungwoo Baek¹, Sieun Hyeon¹, Nam-Joon Kim², and Hyuk-Jae Lee²
(¹OUTTA, Korea, ²Seoul National University, Korea)
- 17 L1-Induced Activation Sparsity Shifts CNN Bias from Texture to Shape**
Sungjae Jeon, Youjin Kim, Seungtae Hong, and Jeong-Si Kim
(ETRI, Korea)
- 18 Object Identification for Metaverse Streaming Services Using Video Signature Embeddings**
WooChool Park, JunHwan Jang, and JongMin Kim
(KETI, Korea)
- 19 Efficient Subnetwork Performance Prediction via Learning-to-Rank Approach**
Hojong Shin, Jonghoon Kwak, and Jonghee Park
(KETI, Korea)
- 20 Gradient-Free Training of SNN with Evolutionary Mating Algorithm for Solving XOR Problem**
Seoyoon Park and Youngmin Kim
(Hongik University, Korea)
- 21 Improving Robustness of Quantized Neural Networks in Processing-In-Memory Architecture via Variation-Aware Distillation**
Jonghoon Kwak, Sung-Joon Jang, and Jonghee Park
(KETI, Korea)

- 22 Oriented SAR Ship Detection via Transformer-Based Denoising and Dynamic Coarse-to-Fine Learning**
Arcum Han and Sunok Kim
(Korea Aerospace University, Korea)
- 23 AI-Driven Real-time Crack Detection System for Industrial Applications**
MinCheol Park, HoangKhanh Lam, Hayotjon Aliev, and HyungWon Kim
(Chungbuk National University, Korea)
- 24 In-Sensor Denoising Using SNN for Frame-based Event Vision Sensor**
Jaehyeon So and Jong Hwan Ko
(Sungkyunkwan University, Korea)
- 25 Performance Characterization of Deep Learning Primitives for Hardware-Aware Mapping on Heterogeneous Edge Accelerators**
Philkyue Shin and Seongsoo Hong
(Seoul National University, Korea)
- 26 A Block-wise Streaming Extension of FastSpeech2 for Real-Time LLM-TTS Cascade Systems**
Uijong Lee, Taewoo Kim, and Young Han Lee
(KETI, Korea)
- 27 A High-Throughput FPGA-Based Softmax Design with Reconfigurable Max-Adder Trees**
Sanghyeok Park¹, Junsu Hwang¹, Xuan Truong Nguyen², and Chachag Yi²
(¹Chung-Ang University, Korea, ²Seoul National University, Korea)
- 28 Automated Theatrical Lighting Design through Parameter-Efficient Fine-Tuning with LoRA-Adapted LLMs**
Sang-Woo Seo^{1,2}, Haedong Kim², and Seokhee Jeon¹
(¹Kyung Hee University, Korea, ²ETRI, Korea)
- 29 Constraining Focus Volume via Deep Weighted Least Squares in Shape from Focus**
Khurram Ashfaq and Muhammad Tariq Mahmood
(Korea University of Technology and Education, Korea)
- 30 SoC Estimation for Hybrid Energy Pack**
Yujeong Yoon¹, Saebin Shin¹, Yerin Byeon¹, Yurim Cheon¹, Xiaoyong Guo², and Wansu Lim¹
(¹Sungkyunkwan University, Korea, ²Tianjin University, China)
- 31 DPU-Aware Hardware-Software Co-Design for Real-Time Semantic Segmentation**
Seung Wook Oh, Gyu Hyeon Hwang, HoBin Oh, HyeonJin Sim, Min Kwon Choi, and Jae Wook Jeon
(Sungkyunkwan University, Korea)



- 32 Challenges and Opportunities of Diffusion-Based AI in MRI: A Critical Evaluation for Brain Age Prediction**
Yongjin Choi, Howook Lee, and Won Hee Lee
(Kyung Hee University, Korea)
- 33 Platform for Labeling based on Unsupervised Time series data Anomaly Detection**
Jihoon Lee and Jaewon Moon
(KETI, Korea)
- 34 Detection of Multi-Person Motion using Wi-Fi Signal**
Netichai Wongkhamphu, Matupol Choochotiros, Soontharee Koopairrojin, Kanyarat Nindam, and Somchoke Rueng-ittinun
(Kasetsart University, Thailand)
- 35 E3-MAS: A Self-Evolution Multi-Agent System Framework**
Ming-Yi Huang, Yao-Zhi Xue, and Chai-Yu Lin
(National Central University, Taiwan)
- 36 Predicting Specific Anomaly Results using Machine Learning Algorithms**
Assel Mukasheva¹, Dina Koishiyeva¹, Almas Saduakas¹, and Jeong Won Kang²
(¹Kazakh-British Technical University, Kazakhstan, ²Korea National University of Transportation, Korea)
- 37 Analysis of Attention Modules in Unfolding Tensor Rank Minimization-Based Pansharpening**
Dung Viet Phan, Chuong Hoang Vo, and Chul Lee
(Dongguk University, Korea)
- 38 Difficulty-Aware Adaptive Augmentation Scheduling for SAR Semi-Supervised Learning**
Hyunseo Choung and Sunok Kim
(Korea Aerospace University, Korea)
- 39 Hardware-Aware Group-Tile Skipping for AWQ-Quantized LLMs**
Hyeonseong Kim and Byung-soo Kim
(KETI, Korea)
- 40 A Comparative Study of YOLO Models for Real-Time Wildfire Detection on Edge Devices**
Jaehyun Ha, Huiseung Ryu, Siwoo Nam, and Sang Hyun Park
(DGIST, Korea)
- 41 Optimized Event Representation and Pipelined Inference for Automotive Event Cameras**
Kyungmo Kim, Seokhun Jeon, Byung-Soo Kim, and Young-Jong Jang
(KETI, Korea)

- 42 Analysis on IPC Partitioning for Tail-Latency Mitigation in HMP Automotive Gateways**
Beom Gi Suh, Young Soo Do, Sung Bhin Oh, Seong Hyeon Lim, Young Min Kim, Chae Eun Lee, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 43 Performance Analysis of a DDS-based Gateway for Multi-Camera Streaming in a Zonal Architecture**
Sung Bhin Oh, Young Soo Do, Beom Gi Suh, Hyo Jin Park, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 44 A High-Precision Voltage Reference Circuit for Battery Management System**
Paul Jeremiah, Hussain Waeed, Wanhae Jeon, Anidozie Lordsday Sunday, Ali Raza, and Inn-Yeal Oh
(Summoon University, Korea)
- 45 Lightweight SOME/IP (twSomeip) Implementation for Reducing Subscription End-to-End Delay**
Young Soo Do, Sung Bhin Oh, Sung Keun Cha, Seong Hyeon Lim, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 46 Beyond Proportional Control: A Comparative ROS2 Simulation on Path Tracking with PID+Pure Pursuit**
Sun Hong Jung, Yeong Gwang Choi, Eunho Kim, Young Hoon Suh, Hyejin Park, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 47 Early Fusion-Based Road Obstacle Risk Classification and Behavior Control Using Camera and 2D LiDAR**
Sungtae Park, Jongwon Jeon, Hye Hyeon Park, and Jae Wook Jeon
(Sungkyunkwan University, Korea)

PS3

15:00~16:20

October 28, Tuesday, 2025

Grand Ballroom B (1F)

Chair: Min-Jae Seo (University of Seoul)

- 01 Protecting Magnetic Field Disturbance by Adding Steel Shield based on Magnetic Field Change Phenomenon**
Jaekyung Pee and Daejin Park
(Kyungpook National University, Korea)

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- 02 RT-YOLACT: Real-Time Instance Segmentation on Zynq SoC for Autonomous Driving**
Gyu Hyeon Hwang, HoBin Oh, Min Kwon Choi, HyeonJin Sim, Seung Wook Oh, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 03 Stable BEV Fusion for Multi-Camera Vehicle Tracking with Wheel-Contact Keypoints and Anchor-Only Tracking**
Eun Ho Kim, YeongGwang Choi, Young Hoon Suh, Hye Jun Hong, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 04 Technology Trends and Requirements Analysis of Development Support Platforms for Future Intelligent Vehicles**
Tai-Gil Kwon and Yongseong Kim
(KETI, Korea)
- 05 A Cost-Effective Autonomous Parking System Using a Two-Channel Vision Sensor and FSM**
Seung Yun Noh, YeongGwang Choi, Eunho Kim, Young Hoon Suh, Hyejin Park, HyeHyeon Park, Hye Jun Hong, KyungHoon Kim, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 06 Performance Analysis of Native SOVD versus SOVD-to-UDS in Virtualized Automotive Diagnostic Systems**
Chae Eun Lee, Seong Hyeon Lim, Young Soo Do, Sung Bhin Oh, Beom Gi Suh, Young Min Kim, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 07 Implementation of an Integrated SoC for Zynq-based DPU and Surround View Monitor**
HoBin Oh, Gyu Hyeon Hwang, HyeonJin Sim, Min Kwon Choi, Seung Wook Oh, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 08 Performance Evaluation of Optimal Parameter Settings for Region-Based Contrast Enhancement in Thermal Imaging Systems**
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(Hamwa Systems Co., Ltd., Korea)
- 09 Robust Dual-Camera Lane-Keeping System Using YOLOv8 and ROS2 for Autonomous Driving Education**
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(Sungkyunkwan University, Korea)
- 10 Real-Time Drowsiness and Lane Departure Warning System Using Deep Learning and Embedded Systems**
Donggyu Seo, Jiyoung Moon, Young Hoon Suh, and Jae Wook Jeon
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- 11 Efficient Vectorization of Binary Sketches for Consumer Product Customization Using Image Processing**
Yanjing Jin¹, Hee Jo¹, Minjung Kim², Hajeong Baek³, Julie Chang², and Jo Woon Chong¹
(¹Sungkyunkwan University, Korea, ²Texas Tech University, USA, ³StyleAI Inc., Korea)
- 12 VISTA: Visual Infrastructure Supporting Technology in Autonomy through Precise, Keypoint-based AVP Localization**
Yeong Gwang Choi, Hye Hyeon Park, Eun Ho Kim, Hye Jun Hong, and Jae Wook Jeon
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- 13 Infrastructure Sensor-Assisted Hybrid A-star Path Planning and PID-Based Control for Autonomous Valet Parking**
Hye Hyeon Park, Yeong Gwang Choi, Hye Jun Hong, Young Hoon Suh, and Jae Wook Jeon
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- 14 AI-based Collision Avoidance Lane Change System**
Dong Yun Seo, Jinny Lim, Han Been Lee, Jae Yong Yu, Yeong Gwang Choi, and Jae Wook Jeon
(Sungkyunkwan University, Korea)
- 15 Baseball Motion Classification with Neural Network for Acceleration Data Collected by Smartphone**
Takahiro Yoshimoto¹, Toshimitsu Honda¹, Kohei Miyase¹, Stefan Holst¹, Shudai Ishikawa², Roshwin Sengupta³, and Ilia Polian³
(¹Kyushu Institute of Technology, Japan, ²National Institute of Technology Oita College, Japan, ³University of Stuttgart, Germany)
- 16 Optimization Study of Electrochemical Antigen Detection Sensor Based on Carbon Electrode**
Sangsik Kim¹, Jain Choi¹, Seojin Jeong¹, Wonhee Lee¹, Hyungjin Jung¹, JinHyoung Kim¹, Kwonhong Lee^{1,2}, Kyu-Sik Shin¹, and Cheolung Cha¹
(¹KETI, Korea, ²Korea University, Korea)
- 17 MEMS Optical Sensor for Mid-Infrared Gas Detection**
Jain Choi¹, Sangsik Kim¹, Seojin Jeong¹, Wonhee Lee¹, Hyungjin Jung¹, JinHyoung Kim^{1,2}, Kwonhong Lee¹, and Cheolung Cha¹
(¹KETI, Korea, ²Korea University, Korea)
- 18 Microplastic Detection by MEMS-Based Microfluidic Sensor**
Seojin Jeong¹, JinHyoung Kim¹, Kwonhong Lee^{1,2}, Sangsik Kim¹, Jain Choi¹, Hyungjin Jung¹, Wonhee Lee¹, and Cheolung Cha¹
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- 19 Performance Contribution and Quantization Sensitivity-based Quantization Strategy for Hybrid Dental Image Segmentation Network**
Senog Min Kim¹, Wan Kim², Jae Hwan Han², Jae hoon Shim², Soon Hyoung Pyo², and Byung Cheol Song¹
(¹Inha University, Korea, ²Osstem Implant Co., Korea)
- 20 PACE: Personalized Adaptive and Contextual Exercise Application for Optimal Scheduling and Fatigue Management**
Lorraine Pearl B. Malubag¹, Brix Mayabason¹, Caitlin Bernadette T. Villanueva¹, I Elizabeth Cha², Yong-Xiang Chen², and Jan Kevin A. Galicia¹
(¹Ateneo de Manila University, Philippines, ²Chung Yuan Christian University, Taiwan)
- 21 Temporal-Aware Multi-Image Vision Transformer for Cervical Cancer Screening via Cervicography**
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- 22 Towards improving tumor segmentation for combined multi-organ datasets**
Hyungsok Moon¹, Woonho Ko¹, Jason Bock Lee^{1,2}, and Il Yong Chun¹
(¹Sungkyunkwan University, Korea, ²Kangbuk Samsung Hospital, Korea)
- 23 Experimental Analysis of Image Quality Effects on Deep Learning Glaucoma Classification**
Heejae Kim¹, Myeongjun Kim², Soo Min Oh³, and Jo Woon Chong²
(¹University of Ulsan, Korea, ²Sungkyunkwan University, Korea, ³Texas A&M University, USA)
- 24 EEG-Informed Adaptive User Experience Questionnaire Generation with Multi-Agent Large Language Models**
Yeonwoo Kim, Min Jae Lee, and Won Hee Lee
(Kyung Hee University, Korea)
- 25 A Wearable Abdominal Sound Device Using Personalized Reduction of Hemodialysis Complications in Dialysis Patients**
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(National Taipei University of Technology, Taiwan)
- 26 IR-UWB Radar-Based Contactless Silent Speech Recognition with Attention-Enhanced Temporal Convolutional Networks**
SungHwa Lee and Jaewon Yu
(Yonsei University, Korea)
- 27 A Dual-Mode Piezoelectric Rectifier Achieving up to 92 % Peak Efficiency at wide range inputs**
Jekyu Lee, Ju-Won Oh, Yun-Gwan Kim, and Kang-Yoon Lee
(Sungkyunkwan University, Korea)

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28 Evaluation of User Responses to Mixed AR/VR Content Experiences

Juyoung Kim, Sangheon Park, and Sung-Uk Jung
(ETRI, Korea)

29 Cognitive Response Augmentation for Senior Users on Universal XR Metaverses

Jong-Sung Kim
(ETRI, Korea)

30 Study on Promoting College Students' Mental Health by AI Music Therapy Based on Big Data Analysis

Xiaoyi Song¹, Jie Zheng², and Jun He¹
(¹Fuzhou University, China, ²Xiamen Institute of Technology, China)

31 From "Optimal" to "Intentional": Strategic Understanding in Fighting Game AI via Large Language Models

Yiyang Liu, Boyu Chuang, Thai Van Nguyen, and Ruck Thawonmas
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32 A Study on the Influence of Ink and Wash Style Noctilucent Effects on Game Atmosphere

Minmin Huang, Xin Fang, and Jun He
(Fuzhou University, China)

33 A Study on the Effectiveness of Situated Cognition for Near and Far Transfer in Educational Games

Chanyuan Yan, Qingyun Lin, Xiaoyi Song, and Jun He
(Fuzhou University, China)

34 Research on Emotional Visualization Design for Pedagogical Virtual Humans

Xin Fang, Minmin Huang, Xiaoyi Song, and Jun He
(Fuzhou University, China)

35 A Study on the Impact of Emotional Icon Design in Otome Mobile Game Interface Design on New Player Retention

Zhiyun Ye, Shanxi Deng, and Jun He
(Fuzhou University, China)

36 Research on Gamification Design Strategies for School Bullying Prevention Applications

Lingling Zheng¹, Haibiao Huang¹, Yaping Qiu¹, and Jun He²
(¹Chengyi College, Jimei University, China, ²FuZhou University, China)

37 A Study on the Correlation Between Metafiction Games and Game Addiction Prevention

Qi Yi and Jeanhun Chung
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38 Robust WiFi Channel State Information-based Localization via Sequence Time Alignment

Dongwoo Kang, Seho Park, and Taehyeon Kim
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39 Verification of the Effectiveness of a Proximity Detection System Using BLE Beacons in a High-Density Crowd Environment

Motoki Masada and Mikiko Sode Tanaka
(National Institute of Technology, Niihama College, Japan)

40 Research on multimode wireless communication system for the Niihama Taiko Festival drum position display application

Haruto Yamada and Mikiko Sode Tanaka
(National Institute of Technology, Niihama College, Japan)

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Minchan Kim, Hoje Lee, and Won Woo Ro
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42 Study on Combination of CBS and ATS in IEEE 802.1TSN on Centralized Zonal In-Vehicle Networks

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43 A Comparison of Numerical Optimization for Configuration of Time-Aware Shaper in Industrial Networks

Momoka Abe, Yoshihiro Ito, and Masamune Nakaoji
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44 VR-based sit-ski simulator contributing to introduction of sports for people with disabilities

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45 A Compact 28-GHz Low Noise Amplifier Using GaAs 0.15-um pHEMT Technology

Sunwoo Kong, Hui-Dong Lee, and Bonghyuk Park
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46 Performance Evaluation of eLoran Spatial ASF Corrections Based on Measured ASF Map

Jaewon Yu¹ and Pyo-Woong Son²
(¹Yonsei University, Korea, ²Chungbuk National University, Korea)

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47 Stepwise Question Rephrasing: Enhancing Long-Context Reasoning in Small-Scale Language Models

Minyoung Kyoung, Hyungbae Jeon, Sungeun Park
(AI Lab Tutorus Labs Inc., Korea)

48 A Comprehensive Labeling Protocol and Real-time Inference Framework for Road Hazard Detection

Jacmin Jeong¹, Yunhee Woo², Dongyoung Kim², Jeongwoo An¹, Minkyu Park¹, Hakhyeon Kim¹, Seongwook Hong³, Hongkwon Kim¹, Jihoon Park², Ji-Ho Cho³, and Jeong-Gun Lee¹
(¹Hallym University, Korea, ²Geomexsoft, Ltd., Korea, ³UnleashifAI Inc., Korea)

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Chair: Kwanseo Park (Yonsei University)

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Jieun Kim and Soochang Chae
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02 12-bit, 640MSps TI-SAR ADC with Clock Distribution Layout Technique for Wifi-6 Application

Seon-Woo Kim, Eun-Chang Kim, Jung-Ki Yeo, In-Sung Hwang, Bo-Geun Jung, Young-Jin Kim, and Choon-Sik Cho
(Korea Aerospace University, Korea)

03 Design of On-Body Matching Networks for Reliable Capacitive Coupling

Sung-Eun Kim, Taewook Kang, Kwang-il Oh, Mi-Jeong Park, Hyuk Kim, Hyung-Il Park, and Jae-jin Lee
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04 Overhead-Aware Resource Management Framework for Multi-RIS-Assisted Wireless Networks

Jihyung Kim¹ and Junyoung Son²
(¹ETRI, Korea, ²Pusan National University, Korea)

05 A Simple Method for Decoupling of Tightly Spaced Stacked Patch Antenna Pair

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06 Multifunctional Wearable Wireless System Based on RF and TENG Hybrid Energy Harvesting

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(Southeast University, China)

07 Reversed Doherty Power Amplifier with Third-Order Intermodulation Distortion Suppression

Anidozie Lordsday Sunday, Wanhae Jeon, Paul Jeremiah, Waheed Hussain, Ali Raza, Khurshid Hussain, and Inn-Yeal Oh
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08 Transactional Logging for Failure Diagnostics in Automotive Reprogramming

Young Min Kim, Seong Hyun Lim, Kyungdong Kwon, Young Soo Do, Sung Bhin Oh, Beom Gi Suh, Chaeun Lee, and Jae Wook
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09 Ensuring QoS in Ultra-Dense Cellular Networks: Necessity of MLB with CAC

Md Mehedi Hasan and Nusrat Jahan Anannya
(American International University-Bangladesh (AIUB), Bangladesh)

10 A CMOS Phased Array Transceiver for mm-Wave Communication Systems

Soo-Chang Chae and Young-Hwan Choo
(KETI, Korea)

11 Design of a Microstrip-Based Dual Bandpass Filter for 2.4GHz and 5GHz WLAN Application

Wonhee Lee¹, Hyungjin Jung^{1,2}, Jain Choi¹, Sangsik Kim¹, Seojin Jeong¹, Kwonhong Lee^{1,2}, JinHyoung Kim¹, and Cheolung Cha¹
(¹KETI, Korea, ²Korea University, Korea)

12 LiDAR-Lane : LiDAR Lane Clustering and Lane Change System

Ye Won Jeon, Yeong Gwang Choi, and Jae Wook Jeon
(Sungkyunkwan University, Korea)

13 Implementation of a V2V Platooning Testbed: Performance Comparison of CACC vs. ACC

Chan Gyu Park, Yeon Su Song, Mina Lim, Beom Gi Suh, and Jae Wook Jeon
(Sungkyunkwan University, Korea)

14 Improving Visual-Inertial Odometry through Multi-VINS-Mono Late Fusion

Minsoo Gu, Kijoung Yoon, Nagycol Lee, Hyo Jin Park, and Jae Wook Jeon
(Sungkyunkwan University, Korea)

15 Reeds-Shepp Path Planning With a Heuristic Cost Function for Autonomous Parking

Hye Jun Hong, Yeong Gwang Choi, Eun Ho Kim, Hye Hyeon Park, and Jae Wook Jeon
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- 16 Containerization Strategy and Automated Fault Recovery through Dynamic Runtime Hot-Swapping in Naval Combat System Software**
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- 17 Adaptive sliding mode observer-based position-sensorless control of switched reluctance motors with stator winding faults**
Juwhan Kim, Gyuwon Kim, Seungwon Choi, and Jaepil Ban
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- 18 PSO-Tuned LQR for Energy-Optimized Control of Two-Wheeled Inverted Pendulum with Trajectory Input Comparison**
Sutthipong Thunyajareen and Jatupon Em-Udom
(Thai-Nichi Institute of Technology, Thailand)
- 19 Research on a DMA-Based BLDC Motor Control System Design Method for Efficient Guided Weapon Actuator Control**
Jongyun Byeon and Daejin Park
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- 20 Plant Deployment of a 3D Modeling and SLAM-Based Inspection System**
Jiho Chang and Jeongho Park
(ETRI, Korea)
- 21 A Unified Hardware Crypto Accelerator for ARIA, HIGHT, LEA, and SEED Block Ciphers**
Young-Jong Jang, Junhyuk Baik, and Byung-Soo Kim
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- 22 Face Anti-Spoofing via Monocular Depth Estimation with Two-Stage Classification**
Yongwoo Lee, Sunghun Yang, Donghyeong Kim, Chaewon Park, and Sangyoun Lee
(Yonsei University, Korea)
- 23 A Lightweight Block Cipher Scheme using Approximate Adders**
Junhyuk Baik, Byung-Soo Kim, and Young-Jong Jang
(KETI, Korea)
- 24 FPGA Implementation of ARM Cortex-M0-Based SoC Supporting Multi-Standard En/Decryption**
Minsu Jeong, Min Ju Bae, and Byeong Yong Kong
(Kongju National University, Korea)



- 25 An Enhanced Mobile RFID Authentication Protocol Based on Parity Check Patching Operation**
Cheng-Ying Yang¹, Chia-Chun Wu², Nan-I Wu³, and Min-Shiang Hwang⁴
(¹University of Taipei, Taiwan, ²National Quemoy University, Taiwan, ³Lunghwa University of Science and Technology, Taiwan, ⁴Asia University, Taiwan)
- 26 A Study on Network Security Situation Prediction**
Jong-Shin Chen¹, Cheng-Ying Yang², Jeng Fong JF Yao³, Hsuan Fu Wang⁴, Shu-Chen Chang⁴, and Min-Shiang Hwang⁵
(¹Chaoyang University of Technology, Taiwan, ²University of Taipei, Taiwan, ³Georgia College and State University, USA, ⁴National Formosa University, Taiwan, ⁵Asia University, Taiwan)
- 27 A Low-Noise Single-Stage Coupling Clock Multiplexer for Multi-Chip Systems**
Kyu-Dong Hwang, Kwang-Il Oh, and Jae-Jin Lee
(ETRI, Korea)
- 28 A Compatible RISC-V SoC Platform for Embedded AI Applications**
Mijeong Park, Kyuseung Han, Sukho Lee, Jae-Jin Lee, and Hyeonuguk Jang
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- 29 Resource-Efficient Multi-Tone Capacitive Touch Detection Using Compressive Sensing and FISTA Reconstruction**
Seongho Cho and Daejin Park
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- 30 A Two-Phase Test Point Insertion Scheme for Low-Power Scan Testing**
Seongjin Lee¹, Hyunbeen Kim¹, Sunghun Jung¹, Jin Hwan Park², Minsuk Sung², and Young-woo Lee¹
(¹Inha University, Korea, ²Teradyne Inc., USA, ³Tanhay Inc., Korea)
- 31 Error-Correction Circuit based PUF Structure for High Reliability SSN**
Byeongmin Choi¹, Sungkwang Yoon¹, Taeuk Im¹, Jin Hwan Park², Minsuk Sung³, and Young-woo Lee¹
(¹Inha University, Korea, ²Teradyne Inc., USA, ³Tanhay Inc., Korea)
- 32 Ambipolar Thin-Film Transistors Based on Low-Dimensional Semiconductor Heterostructures**
Sujin Baek¹, Suhyeon Kim¹, Hye Young Lee¹, Jinhyeok Pyo², Sangyeon Pak², and Bongjun Kim¹
(¹Sookmyung Women's University, Korea, ²Hongik University, Korea)
- 33 Impact of Indium Composition on the Self-Heating Reliability of IGZO Thin-Film-Transistors**
Hyeon-Woo Lee, Chae-Eun Oh, and Hyuck-In Kwon
(Chung-Ang University, Korea)
- 34 Radiation Stability of Al₂O₃-Passivated IGTO Thin Film Transistors under High-Energy X-Ray**

- Irradiation**
Yeong-Gwon Jeong¹, Kie Yatsu¹, Ick-Joon Park², and Hyuck-In Kwon¹
(¹Chung-Ang University, Korea, ²Joongbu University, Korea)
- 35 Improved Threshold Switching Characteristics in Ag/HfO₂ Device by Ni Barrier Engineering**
Sanghyun Kang¹, Hyoung Won Baac¹, and Changhwan Shin²
(¹Sungkyunkwan University, Korea, ²Korea University, Korea)
- 36 Steep-Switching Transistors Enabled by Ag/HfO₂ Threshold Switching Device Integration**
Sanghyun Kang¹, Hyoung Won Baac¹, and Changhwan Shin²
(¹Sungkyunkwan University, Korea, ²Korea University, Korea)
- 37 Optimizing the Sensing Performance of Junctionless Transistor Chemical Sensors through Channel Thickness Modulation**
Dae-Young Jeon
(Gyeongsang National University, Korea)
- 38 A Low-Power Multi-Channel Neural Recording System with Multiplexed Programmable Gain Amplifier**
Hyungiin Jung¹, Kwonghong Lee¹, JinHyoung Kim¹, Wonhee Lee¹, Sangsik Kim¹, Jain Choi¹, Seojin Jeong¹, Cheolung Cha¹, and Hyung-Min Lee²
(¹KETI, Korea, ²Korea University, Korea)
- 39 SnO₂ seed layer assisted Low-Temperature Atomic Layer Deposition of high-k rutile TiO₂ for advance DRAM capacitor**
Sang Beom Seo¹, Inhong Hwang¹, Yoohyeon Jung¹, Jaemin Jung¹, Won Yong Choi², Dahui Jeon¹, and In-Hwan Baek¹
(¹Inha University IPCC, Korea, ²Genesem Inc., Korea)
- 40 Improving Indium Oxide Thin-Film Transistors Performance and Reliability through CF₄ and O₂ plasma Treatments**
Jun-Yong Lee¹, Inhong Hwang¹, Dahui Jeon¹, Won Yong Choi², and In-Hwan Baek¹
(¹Inha University IPCC, Korea, ²Genesem Inc., Korea)
- 41 An Enhanced Transient Response and Low Quiescent Current Capacitor-Free Low-Dropout Voltage Regulator with Pseudo-Differentiator-Based Compensation**
Donghwan Kim¹, Woosol Han², Minsuk Sung², and Jaehoon Jun²
(¹Inha University, Korea, ²Inha University IPCC, Korea, ³Tanhay Inc., Korea)



- 42 Optimized Design of a High-Efficiency PWM Buck Converter for Low-Voltage Power Management**
Kangjae Lee¹, Hyunsoo Chung¹, Sangwoong Sim², Minsuk Sung³, and Jaehoon Jun²
(¹Inha University, Korea, ²Inha University IPCC, Korea, ³Tanhay Inc., Korea)
- 43 Simulation Study of Sidewall Engineering in InGaN/GaN Blue Micro-Light-Emitting diodes**
Sangjin Yu¹, Gyuwon Lee¹, Yeonbin Kang², WonYong Choi³, and Dae-Myeong Geum²
(¹Inha University, Korea, ²Inha University IPCC, Korea, ³Genesem Inc., Korea)
- 44 Design of a Cascaded Floating Inverter Amplifier with Stability-Enhanced Technique**
Seongho Park¹, Kconhee Sim², Wonyong Choi³, and Jaehoon Jun²
(¹Inha University, Korea, ²Inha University IPCC, Korea, ³Genesem Inc., Korea)
- 45 Design of a Cascoded Floating Inverter Amplifier for Gain Enhancement**
Hyemi Park¹, Chaerin Hwang¹, Seyoon Kim², Wonyong Choi³, and Jaehoon Jun²
(¹Inha University, Korea, ²Inha University IPCC, Korea, ³Genesem Inc., Korea)
- 46 Reliable Design of Asynchronous Isolated Communication in High Voltage Battery Monitoring System**
Seong-Ho Oh, Jong-Hun Kim, Ah-Rum Hur, Seung-Yeon Kim, Sung-Hoon Bang, and Sang-Ho Lee
(Hyundai Mobis Co., Ltd., Korea)
- 47 A High-Speed 8-bit Single-Channel SAR ADC with Tailored Bit Intervals**
Xinyu Li¹ and Kentaro Yoshioka²
(¹Nanjing University, China, ²Keio University, Japan)
- 48 A Low-Cost Quantitative Evaluation Testbed of Small-Sized IMU Sensor Modules Using a Smartphone**
Myeongjun Kim, Seungmin Lee, Junjae Park, Nahyun Lee, and Jo Woon Chong
(Sungkyunkwan University, Korea)

MUST-VISIT PLACES IN BUSAN



Haeundae Beach



Haeundae is a must-visit site when you visit Busan.

[Information]

- Haeundae Tourism Facility Management Office
- +82-51-749-7611~7
- www.haeundae.go.kr



Haedong Yonggungsa Temple



The Portrait of Putai marking the start of the 108-step stairway leading into the main temple site is stained with handprints because of the rumor that touching the belly of the beloved Buddhist deity in this portrait can make women bear and give birth to sons.

There are three famous food and drinks to try near Busan Haedong Yonggungsa Temple. They are seafood black bean noodles (haemul jjajang myeon), Korean full course meal (hanjeongsik), and coffee. The old cafes and restaurants around Yonggungsa Temple and their famous dishes are worth experiencing.

[Information]

- Songjeong Tourist Information Center : +82-51-749-5800
- http://www.yonggungsa.or.kr



Dongbaekseom Island



Located at the southern end of Haeundae Beach, Dongbaekseom Island creates a picturesque scene in harmony with a thick forest of camellias and pine trees. Tourist attractions in Dongbaekseom Island include a walking path and the Nirimaru APEC House built for the 2005 APEC summit.

Lifestyle store located inside the dining pub on the second floor of The Bay 101. The kitchen concept store suggests a tastier way of living by introducing a wide variety of Korean and International food and beverage, cookware, and brands.



Marine City



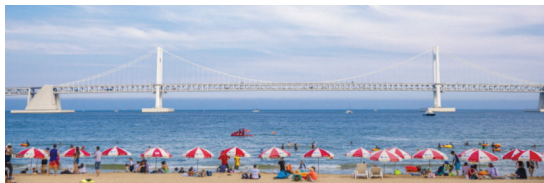
Cafes began cropping up throughout Marine City, and locals have taken to calling the area "Marine City Cafe Street." The cafe-lined street also features dozens of restaurants, bars, and other eateries that continue to draw gourmet lovers in search of good meals and desserts. With the Movie Street right in front, the Cafe Street is a beloved feature of the famed Haeundae nightscape.

Haeundae Cine Road extends from Dongbaekseom Island to the Yacht Center. It features trick art on the ground as well as a 10 Million-viewers Movies Zone, Animated zones, Haeundae Background Movie Zone, and more. You can also appreciate the sculptures and hand prints in Santorini Square



Gwangalli Beach

Gwangalli Beach is known for its breathtaking night view with Gwangandaegyo Bridge stretching across the ocean in the background. You can find differently themed streets around Gwangalli Beach featuring a variety of concerts and things to enjoy in all seasons, including the annually held Busan Fireworks Festival.



Equipped with the world's largest LED lighting and sound facilities for bridges, Gwangandaegyo Bridge has a multidimensional outdoor landscape lighting system. You will be able to enjoy the breathtaking view of the bridge with fantastic lighting from sunset to 12:00(midnight) on weekdays (from Sunday to Thursday) and from sunset to 2:00 a.m. on weekends (from Friday to Saturday) as well as an amazing laser show three times a day (8:30, 9:30, 10:30 p.m.) for about 10 minutes over the beautiful night sea of Gwangalli.

[Information]

- Suyeong District Office : +82-51-610-4000
- U-Tourist Information Center : +82-51-610-4848
- www.gwanganbridge.bisco.or.kr



BIFF Square



It is the best-known place where you can feel the atmosphere of Busan, a city of film. Do not miss an exciting chance to take a look at the handprints of filmmakers and enjoy the delicious local food.

One of the specialties available near BIFF Square is Ssiat hotteok, a sweet Korean pancake stuffed with seeds. The Ssiat hotteok snack cart that was visited by singer Lee Seung-gi has a particularly long line of customers

[Information] ● www.bsjunggu.go.kr



Gukje Market

It is an enormous market located in Nampo-dong, which can be roughly divided into several subsections, such as Food Street, Youth Street, Everything Street, Arirang Street, and Vintage Street. It is also known as "Dottegi Market." "Dottegi Market" refers to a disorderly, bustling, and unusual flea market where people used to sell off second-hand goods and junk at wholesale, retail, or under the table prices. The name originated from the fact that when Japanese people rushed back home following the independence of Korea, their leftover belongings went up for bidding. It has been said that there were lucky people who received a financial windfall at that time. One more thing to keep in mind is that this place is known as the heaven of snacks because each cranny is full of street snacks, including spicy glass noodles, sweet red bean porridge, and spicy rice cakes.



[Information]

- Gukje Market Cooperative : +82-51-245-7389
- gukjemarket.co.kr



Note.