KOREAN SOCIETY FOR INTERNET INFORMATION

The 17th Asia Pacific International Conference on Information Science and Technology

(APIC-IST 2022)

June 19-21, 2022, Skybay Hotel Gyeongpo, Korea

http://www.apicist.org/2022

Conference Program

| Organized by |

Korean Society for Internet Information (KSII)

Contents

A Message from Honorary Chair

I express my warm heartfelt welcome to all of attendants of the 17th Asia Pacific International Conference on Information Science and Technology (APIC-IST 2022) that will be held from June 19~21, 2022 in Skybay Hotel Gyeongpo, Republic of Korea .

I deeply appreciate all contributors for submitting papers, chairing sessions, and reviewing papers. And I must thank for the support we received from many companies.

Over the past 22 years, KSII (Korea Society for Internet Information) has increased its academic impact and influence in the area of Information Science, Computer Engineering and Internet Technology both worldwide and nationwide through this international conference and its SCIE-indexed journal, the *KSII Transactions on Internet and Information Systems* (TIIS).

As many of you have witnessed, APIC-IST is one of important International Conferences which KSII have provide annually. The amount of interest towards the internet is never decreasing among both the international academic and practitioners' communities. Topics covered in APIC 2022 truly represent the comprehensiveness of this conference. We are sure that APIC-IST 2022 will provide you with a wealth of information and many opportunities for future discussion.

Many people have worked hard to make APIC 2022 successful. A variety of conference arrangements and special events as well as well organized program have been prepared by the Conference Chair Prof. Mingoo Kang (Hanshin Univ., ROK), Program Chairs Prof. Min Hong (Soonchunhyang Univ., ROK), Prof. Imran Ghani (Virginia Military Institute, USA). I also express my special thanks to the Keynote Speakers Dr. Thomas Coughlin who is Coughlin Associates, Inc., San Jose, Calif., USA and Dr. Md Zia Uddin who is SINTEF Digital, Oslo, Norway.
In addition, my special thanks go to Advisory Board members, Program Committee members, Steering Committee members.

Last but not least, I would like to thank all authors and speakers again for their valuable research papers and efforts to make the 17th APIC-IST 2022 a success!
I wish a great success in their future endeavor and look forward to meeting you all again at ICONI 2022 that will be held on December Jeju Island, Korea.

Dr. Myung-Mook Han

Honorary Chair of APIC-IST 2022

A Message from Conference Chair

Dr. Mingoo Kang
Hanshin University, ROK

Welcome to the 17th Asia Pacific International Conference on Information Science and Technology (APIC-IST 2022). which will be held on June 19-21, 2022, at Skybay Hotel Gyeongpo, Republic of Korea. APIC-IST is an annual conference organized by KSII providing an open forum for researchers, engineers, policy makers, and service providers in the Information Science and Technology.

In this year, we are glad to invite the prospective authors to submit oral & poster papers in the following areas: Smart Phone Applications and Service, Mobile Internet Computing / Wireless and Sensor Network, Security & Privacy in Internet / IoT (Internet of Things) & Machine to Machine / Multimedia, Image Processing & HCI, Intelligent Systems / Database, Data Mining, Big Data & Mobile Object Database / Software Engineering & Architecture, Cloud Computing / Smart Learning, e-Learning, Learning Contents & Management Systems / Management of Internet Application & E-Business, E-Commerce / SNS & Communications / Digital media use & effects / AI and AI Application for Internet and Information / Future Information Security / KETI Workshop / AI and Big Data Technologies for Crime Prevention / Digital Forensics / ICT Standardizations / SW Challenges (Undergraduate Students)

As time goes on, annual APIC-IST conference becomes more qualified conference in which many honorable researchers participate to share their valuable research results. APIC-IST 2022 offers 2 invited talks, 19 sessions and a special workshop that present the latest results in various research fields of ICT (Information Communication Technology).

I must thank to all the authors and speakers for the research papers on their precious achievements. Gangneung, the most popular tourist destinations of Republic of Korea is known as a beautiful and historical place in the world. I hope all participants of APIC-IST take this opportunity to explore and experience encounter beautiful nature simultaneously while staying in Republic of Korea .

Dr. Mingoo Kang
Conference Chair of APIC-IST 2022

A Message from Program Chairs

It is a pleasure to welcome you to the 17th Asia Pacific International Conference on Information Science and Technology (APIC-IST 2022). The APIC-IST 2022 will be held at Gangneung, Korea on June 19-21. The APIC-IST, hosted by Korean Society for Internet Information (KSII) is the premier conference in the Asia Pacific region. The hosting organization (KSII) is the largest Internet academic society in Korea.
Over the past 17 years, APIC-IST has grown to be the major international conference in Information Science and Technology area. APIC-IST continues the endeavor of high-quality, broad international participation in all areas of Information Science and Technology.

Dr. Min Hong
Soonchunhyang Univ., ROK

Although it is a difficult time to visit abroad due to the COVID-19, we decided to hold APIC-IST 2022 for continuing academic exchange between ICT related scholars using ICT technology such as online presentation. It aims to provide a high-quality forum for researchers and practitioners to share research findings, practices and ideas on key issues in Internet related technologies, services, and administrations. The APIC-IST 2022 Program Committee organizes as a set of thirteen(16) tracks and welcomes presentations of completed research papers as well as research-in-progress papers, panel discussion, and posters covering those issues.

Dr. Imran Ghani
Virginia Military Institute, USA

The successful organization of APIC-IST has required the talents, dedication and time of many volunteers from USA, Norway, Vietnam, Pakistan, Malaysia, Saudi Arabia and Republic of Korea. Special gratitude and appreciation go to Dr. Myung-Mook Han, Dr. Mingoo Kang and various session chairs. We would also like to thank the various session chairs as they are primarily responsible for the content of the technical program.

All submitted papers went through a fair paper review process and excellent 118 papers will be presented at APIC-IST 2022. We would like to thank to all the authors and speakers for submitting and presenting their valuable research papers at APIC-IST 2022.

Dr. Min Hong Dr. Imran Ghani
Program Chairs of APIC-IST 2022

Keynote Speakers

Keynote Speaker Dr. Thomas Coughlin

President, Coughlin Associates, Inc., San Jose, Calif., USA

Title: The Memory of Artificial Intelligence

Abstract of the talk:

The use of various types of artificial intelligence (AI) is increasing in the data center, in factories, at the network edge and even in endpoint devices, such as smart watches. AI training and inference requires processing a lot of digital data. Traditional von Neumann computer architectures consume a lot of energy moving data around. This talk will look at processing closer to memory (including persistent memory such as MRAM, RRAM and FRAM) and storage from the data center to endpoint devices. This processing will require new computer architectures using UCIe, CXL, OMI and NVMe-oF that enable processing closer to where the data lives. These new architectures will soon dominate many computing tasks.

Short Bio :

Tom Coughlin, President, Coughlin Associates is a digital storage analyst and business and technology consultant. He has over 40 years in the data storage industry with engineering and senior management positions at several companies. Coughlin Associates consults, publishes books and market and technology reports (including The Media and Entertainment Storage Report and an Emerging Memory Report), and puts on digital storage-oriented events. He is a regular storage and memory contributor for forbes.com and M&E organization websites. He is an IEEE Fellow, Past-President of IEEE-USA, Past Director of IEEE Region 6 and Past Chair of the Santa Clara Valley IEEE Section, past VP of the IEEE CTSoc, Chair of the Consultants Network of Silicon Valley and is also active with SNIA and SMPTE. For more information on Tom Coughlin and his publications and activities go to www.tomcoughlin.com.

Keynote Speakers

Keynote Speaker Dr. Md Zia Uddin

Sustainable Communication Technologies Department,
SINTEF Digital, Oslo, Norway

Title: Sensors and Machine Learning for Assisted Living

Abstract of the talk:

Worldwide, the total amount of people is growing day by day. As the elderly population with age 60 years or more is increasing quite faster than youth with age 10-24 years, there will be fewer people to take care of the elderly in the future. Hence, there should be the necessity of assisted living technologies to take care of people especially elderly or disabled, to help them living independent daily life. User care at home is a matter of great concern since unforeseen circumstances might occur that affect people's well-being. Technologies that assist people in independent living are essential for enhancing care in a cost-effective and reliable manner. Assisted care applications often demand real-time observation of the environment and the resident's activities using an event-driven system. As an emerging area of research and development, it is necessary to explore the approaches of the user care at assisted living systems to identify current practices for future research directions. This keynote presentation is aimed at a discussion of data sources (e.g., sensors) with machine learning for various smart user care approaches for assisting living technologies. Different types of data sources such as motion, video (i.e., RGB, depth, and thermal), sound, and wearables will be discussed in association with machine learning (e.g., deep learning and XAI) algorithms. Research that is related to the use of user monitoring technologies in assisted living is very widespread, but it is still consists mostly of limited-scale studies. Hence, user monitoring technology is a very promising field, especially for long-term care. However, monitoring of the users for smart assisted technologies should be taken to the next level with more detailed studies that evaluate and demonstrate their potential to contribute to prolonging the independent living of people. This presentation will discuss towards that direction.

Short Bio :

Md Zia Uddin completed his PhD degree in Biomedical Engineering in 2011 from Kyung Hee University of South Korea. Then, he served as a faculty member in reputed universities with good world ranking such as Sungkyunkwan University (QS world ranking 88 in 2021). He is currently working as a Research Scientist in Sustainable Communication Technologies department of SINTEF Digital, Oslo, Norway. SINTEF is the largest research institute in Scandinavia and one of the largest research institutes in Europe. His research fields are mainly focused on data & feature analysis from various sources (sensors and others) for physical/mental healthcare using machine learning/artificial intelligence. Dr. Zia has a good teaching experience with more than 20 computer science-related courses from bachelor's degree to PhD. He has got more than 130 research publications including prestigious international journals (e.g., Information Fusion with impact factor of 12.98), conferences, and book chapters. His google scholar citations are more than 2500. He got Gold Medal Award (2008) for academic excellence in undergraduate study. He was also Awarded Korean Government IT Scholarship (March 2007 to February 2011) and Kyung Hee University President Scholarship (March 2007 to February 2011). His research works received best/outstanding paper awards in several peer reviewed international conferences. He acted as a reviewer in many prestigious journals including IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Information Fusion, IEEE Transactions on Industrial Informatics, and IEEE Transactions on Biomedical Engineering, etc. Dr. Zia has been recently enlisted in the World's Top 2% Scientists for Single Year 2019 and 2020 by Stanford University of USA and Elsevier BV. For more information.
: https://sites.google.com/site/webpagezia/home.

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Conference Program

Sun / Jun. 19, 2022	Room 1
16:00-18:00	VIP Reception & Greetings

Mon / Jun. 20, 2022	Room 1	Room 2	Room 3
08:30-	Registration		
09:00-10:30	Session 1	Session 2	Session 3
10:40-11:10	Opening Ceremony & Keynote Speech /		
11:20-12:20	Session 4	Session 5	Session 6
12:20-13:30	Lunch (11:30-13:30)		
13:40-15:10	Session 7	Session 8	Session 9
15:20-17:30	Session 10	Session 11	Session 12
18:00-19:30	Award Ceremony & Banquet		

Tue / Jun. 21, 2022	Room 1	Room 2	Room 3	Room 4
09:00-10:30	Session 13	Session 14	Session 15	Session 16
10:40-12:10	Session 17	Session 18	Session 19	
12:10-13:30	Lunch (11:30-13:30)			
13:40-15:30	Panel Discussion 1: Collaborative Research			
15:40-17:30	Panel Discussion 2: Collaborative Research			

Conference Program

Sun, June 19, 2022

16:00-18:00	VIP Reception & Greetings

Mon, June 20, 2022

09:00-10:30	Session 1: KETI Workshop I
	Session 2: Smart Phone Applications and Service / Mobile Internet Computing & Smart Learning / e-Learning / Learning Contents Management Systems & Management of Internet Application / E-Business / E-Commerce
	Session 3: AI and AI Application for Internet and Information
10:40-11:10	Opening Ceremony & Keynote Speech
11:20-12:20	Session 4: Future Information Security I
	Session 5: KETI Workshop II
	Session 6:Database / Data Mining / Big Data / Mobile Object Database
12:20-13:30	Lunch (11:30-13:30)

Conference Program

Mon, June 20, 2022

13:40-15:10	Session 7: KETI Workshop III
	Session 8: Interactive Presentation Session I
	Session 9: Future Information Security II
15:20-17:30	Session 10: Digital Forensics
	Session 11: Interactive Presentation Session II
	Session 12: Multimedia / Image Processing / HCI / Intelligent Systems I
18:00-19:30	Award Ceremony & Banquet

Tue, June 21, 2022

09:00-10:30	Session 13: AI and Big Data Technologies for Crime Prevention I
	Session 14: Multimedia / Image Processing / HCI / Intelligent Systems II
	Session 15: Wireless and Sensor Network / Security & Privacy in Internet & IoT (Internet of Things) / Machine to Machine & SW Challenges (Undergraduate Students)
	Session 16: Software Engineering & Architecture / Cloud Computing

Conference Program

Tue, June 21, 2022

10:40-12:10	Session 17: AI and Big Data Technologies for Crime Prevention II
	Session 18: IoT (Internet of Things) / Machine to Machine
	Session 19: ICT Standardizations
12:10-13:30	Lunch (11:30-13:30)
13:40-15:30	Panel Discussion 1: Collaborative Research
15:40-17:30	Panel Discussion 2: Collaborative Research

*** Presentation Time**

- **Oral Session: 10 minutes Presentation / 5 minutes Q&A**

Conference Program

| 09:00-10:30, Mon, June 20, 2022 |

Session 1: KETI Workshop I (Room 1) **09:00-10:30, Mon, June 20, 2022**	**Chair: Dr. Kiwon Kwon (KETI, ROK)**
1-1	Design of High-Speed Pose Estimator for Real-Time Human-Vehicle Interaction
	Minjoon Kim, Jaehyuk So (Korea Electronics Technology Institute, ROK)
1-2	Maritime Communication Traffic based Adaptive Beam Hopping Method in DVB-S2X
	Juhyoung Sung, Sungyoon Cho, Wongi Jeon, Yangseob Kim, Kiwon Kwon (Korea Electronics Technology Institute, ROK)
1-3	3.2Gb/s Fiber Optic Transmitter and Receiver ICs for Next-Generation In-Vehicle Networks
	Wonseok Oh, Young-Jong Jang, Kangyeob Park (Korea Electronics Technology Institute, ROK)
1-4	Design of a 20-Gb/s x 12-Channel Optical Receiver Array in 55-nm CMOS Technology
	Kangyeob Park, Wonseok Oh (Korea Electronics Technology Institute, ROK)
1-5	A study on Ornamental Fish Recognition in Quarantine Environment using CNN-based YOLOv4 and YOLOv5
	Hyunhak Song, Sungyoon Cho, Yangseob Kim, Byoungchul Song, Kiwon Kwon (Korea Electronics Technology Institute, ROK)
1-6	Deep Learning based Human Activity Recognition
	Yong-Suk Park (Korea Electronics Technology Institute, ROK)

Continue next page (session 1)

Session 1: KETI Workshop I (Room 1) 09:00-10:30, Mon, June 20, 2022	Chair: Dr. Kiwon Kwon (KETI, ROK)
1-7	Distance Level Estimation based on Ship Wake Image for the Protection of the Aid to Navigation Facility
	Hyochan Lee, Juhyoung Sung, Sungyoon Cho, Kyungwon Park, Byoungchul Song, Kiwon Kwon (Korea Electronics Technology Institute, ROK)
1-8	Design of a Multi-Device Control Interface System for Lighting Effect Production
	Sunghun Chae, Young Bo Shim (Korea Electronics Technology Institute, ROK)
1-9	Development of an Unmanned Vehicle System for Processing High-Precision Image Data for Land Survey
	Jong-Hong Park, Sung-Chan Choi, Wonseok Jung, Il-Yeop Ahn (Korea Electronics Technology Institute, ROK)

Session 2: Smart Phone Applications and Service / Mobile Internet Computing & Smart Learning / e-Learning / Learning Contents Management Systems & Management of Internet Application / E-Business / E-Commerce (Room 2)

Chair: Dr. Sangmin Lee

09:00-10:30, Mon, June 20, 2022 **(CHA Univ., ROK)**

2-1	A Close Contact Tracing Method Applicable to Ship Environments
	Qianfeng Lin, Jooyoung Son (Korea Maritime & Ocean Univ., ROK), Zejin Tao (Pukyong National Univ., ROK)
2-2	KYC and Security in NFT Market Place
	Geunyoung Kim, Junseok Kim, Jaecheol Ryou (Chungnam National Univ., ROK)
2-3	ML based Ecommerce Price Negotiator Agents: Algorithms and Techniques
	Aliza Aziz, Anosha Fatima, Isma Farah Siddiqui (Mehran Univ. of Engineering & Technology, Pakistan)
2-4	Implementation of an Untact Online Education Service Platform using an OTT Device with an Emphasis on AWS Cloud Services
	Yejin Jang, Yumin Jo, Jiin Shin, Yunjeong Jang, Suyeong Kim, Siyoung Lee, Jongho Paik (Seoul Women's Univ., ROK)
2-5	A study on user acceptance intention of insurtech digital Insurance platform service in Korea
	Eunseok Kim (Kyobo Life Insurance Company, ROK), YoungJun Kim (Korea Univ., ROK)
2-6	ML Based Future Stock Price Prediction using Linear Regression
	Muskan Muskan, Isma Farah Siddiqui (Mehran Univ. of Engineering & Technology, Pakistan)

Session 3: AI and AI Application for Internet and Information (Room 3) 09:00-10:30, Mon, June 20, 2022	Chair: Dr. Inseop Na (Chosun Univ., ROK)
3-1	Dataset construction method for network intelligence
	SoYeon Lee, Jihoon Park, Tae-Jun Yoon, MinJi Bae, Dae-Young Kim (Soonchunhyang Univ., ROK)
3-2	Identifying the Emergence of AI related Convergences
	Seo Yeon Lee, Ji Min Kim, Won Sang Lee (Gangneung-Wonju National Univ., ROK)
3-3	Federated Deep Reinforcement Learning for Dynamic Task Offloading in Software-Defined Edge Computing Systems
	Seungwoo Kang, Yeonho Jo, Prohim Tam, Seokhoon Kim (Soonchunhyang Univ., ROK)
3-4	Adaptive Model Update Policies for Federated Learning-Assisted Edge Applications in Industrial IoT Networks
	Seyha Ros, Geonho Cha, Prohim Tam, Seokhoon Kim (Sonchunhyang Univ., ROK)
3-5	The Healthcare Digital Twin Architecture for Risk Prediction Management
	Se-Min Hyun, KangYoon Lee (Gachon Univ., ROK)
3-6	Optimizing Edge Selection Policies for Federated Edge Learning in SDN/NFV-Enabled IoT Networks
	Inseok Song, Geonho Cha, Chanthol Eang, Sa Math, Seokhoon Kim (Soonchunhyang Univ., ROK)

Session 4: Future Information Security I (Room 1)	
11:20-12:20, Mon, June 20, 2022	Chair: Dr. Kyungyong Chung (Kyonggi Univ., ROK)
4-1	A Study on the Derivation of Cyber Attack Mitigation Technology using MITRE Framework in Industrial Control System
	InSung Song, Jung Taek Seo (Gachon Univ., ROK)
4-2	SDP based Zero-Trust Architecture: An Improved Network Security Mechanism
	Waleed Akbar, Javier J. D. Rivera, Khan T. Ahmed, Afaq Muhammad, Wang-Cheol Song (Jeju National Univ., ROK)
4-3	Proposal of Cyber Attack Detection System in Photovoltaic System Environment
	Ju Hyeon Lee, Jung Taek Seo (Gachon Univ., ROK)
4-4	Design of Quantum key-sharing model based on Quantum Machine Learning algorithms
	Haerim Kim, Subin Yang, Byunghoon Kim, Aeyoung Kim (Hanshin Univ., ROK)

Session 5: KETI Workshop II (Room 2) 11:20-12:20, Mon, June 20, 2022	Chair: Dr. SungYoon Cho (KETI, ROK)
5-1	Instance Segmentation for Video Editing
	Yong-Suk Park, Hyun-Sik Kim, Hyoungsung Kim (Korea Electronics Technology Institute, ROK)
5-2	Future vehicle technology Trend Analysis using Topic Modeling
	Daekyeong Nam, Gyunghyun Choi (Hanyang Univ., ROK)
5-3	A Distributed Framework for Real-time 3D Human Pose Estimation from Multi-Views
	Taemin Hwang, Jieun Kim, Minjoon Kim (Korea Electronics Technology Institute, ROK)
5-4	A Study on the Microservice Unit Resource Metric Data Formation Module Collection Technology Supporting kubernetes-based AIOps
	Jonghwan Park, Jaegi Son, Dongmin Kim (Korea Electronics Technology Institute, ROK)

Session 6: Database / Data Mining / Big Data / Mobile Object Database (Room 3)	
11:20-12:20, Mon, June 20, 2022	Chair: Dr. Jongwook Woo (California State Univ., Los geles, USA)
6-1	Machine Learning-based Prediction of Relative Regional Air Volume Change
	YongHyun Lee, Eunchan Kim (Seoul National Univ., ROK), Jiwoong Choi (Univ. of Kansas Kansas City, USA), Kum Ju Chae (Biomedical Research Institute of Jeonbuk National Univ., Hospital, ROK), Chang Hyun Lee (Seoul National Univ., Hospital, ROK)
6-2	Solving Multi-object Flexible Job Shop Scheduling Problem Using Improved Gene Algorithm and Iterative Local Search
	Xiaorui Shao, Yeonjee Choi, Chang Soo Kim (Pukyong National Univ., ROK)
6-3	A TabNet-based Deep-Learning Prediction Model for Steel-Plate Faults Classification
	So-Hyang Bak, Dong-Keun Oh, In-Kyoo Chun, Kyoung-Sook Kim, Kwanghoon Pio Kim (Kyonggi Univ., ROK)
6-4	Datamining method comparison for health prediction
	Manyoung Park (Korea Institute of Oriental Medicine, ROK)
6-5	Scalable Price Prediction Models of Hosting Business Leveraging Big Data with GPU
	Samyuktha Muralidharan, Savita Yadav (California State Univ., Los Angeles, USA), Sanghoon Lee (Yonsei Univ., ROK), Jongwook Woo (California State Univ., Los Angeles, USA)

Session 7: KETI Workshop III (Room 1)

13:40-15:10, Mon, June 20, 2022

Chair: Dr. Jongho Paik
(Seoul Women's Univ., ROK)

7-1	Analysis of 3D reconstruction performance with various sensors
	Sukwoo Jung, Youn-Sung Lee, Joo young An, KyungTaek Lee (Korea Electronics Technology Institute, ROK)
7-2	Development of an Apparatus for Wafer Alignment System Consisting of Multiple Vision module and Motorized Stages
	Dong-Hyun Lee, Jae-Hyuk So (Korea Electronics Technology Institute, ROK)
7-3	Implementation of Ultrasonic Signal Processing Chip
	Youn-Sung Lee, Hui-Kwan Yang, Chan-Kyu Bae, Seul-Gi Oh, Jae-Young Shin, Soo-Hyoung Lee (Korea Electronics Technology Institute, ROK)
7-4	Cloth-landmark Detection using Mask-RCNN
	Jieun Kim, Teamin Hwang, Minjoon Kim (Korea Electronics Technology Institute, ROK)
7-5	Deep Learning based Object Detection and Video Streaming in Unmanned Vehicle Communication Networks
	Sung-Chan Choi, Jong-Hong Park, Sungwook Jung, Wonseok Jung, Il-Yeop Ahn (Korea Electronics Technology Institute, ROK)
7-6	Pulsed VCSEL Driver Module for Mid-range Mobile Direct ToF sensor
	Young Bo Shim, Ji-Eun Kim (Korea Electronics Technology Institute, ROK)

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Session 7: KETI Workshop III (Room 1) 13:40-15:10, Mon, June 20, 2022	Chair: Dr. Jongho Paik (Seoul Women's Univ., ROK)
7-7	Sea Fog Level Estimation Based on Haze Image Model for the Protection of Aids to Navigation
	Eunji Ryu, Sungyoon Cho, Kyungwon Park, Yangsub Kim, Wongi Jeon, Kiwon Kwon (Korea Electronics Technology Institute, ROK)
7-8	Interfacing between EdgeX and oneM2M with Event-driven Communication
	Seokjun Lee, Nakmyung Sung, Chungjae Choe (Korea Electronics Technology Institute, ROK)
7-9	LTE-based Remote Controller System Architecture for Multi-Drone Operation
	Wonseok Jung, Jong-Hong Park, Sungwook Jung, Il-Yeop Ahn (Korea Electronics Technology Institute, ROK)
7-10	A localization method for micro disposable IoT devices using deep learning-based object detection
	Chungjae Choe, Seokjun Lee, SeungMyeong Jeong, Seongyun Kim, Nak-Myoung Sung (Korea Electronics Technology Institute, ROK)

Session 8: Interactive Presentation Session I (Room 2)	
13:40-15:10, Mon, June 20, 2022	Chair: Dr. Seokhoon Kim (Soonchunhyang Univ., ROK)
8-1	Autonomous Vehicle Network Standardization trend – focusing on 3GPP
	Jeongwook Go, Kanghae Lee (Telecommunications Technology Association, ROK)
8-2	The new features of oneM2M for building IoT echo system
	Youngjae Kim, Seok-Kyu Kang, Kanghae Lee (Telecommunications Technology Association, ROK)
8-3	A Study on Global Policy and Standardization of Data Platform
	Jungyup OH, Kihun Kim, Jonghwa Lee, Kanghae Lee (Telecommunications Technology Association, ROK)
8-4	A Study on key features of 3GPP Standards for the demonstration of Private 5G network in Smart Energy
	Sookhyun Jeon (Telecommunications Technology Association, ROK), Jaeseung Song (Sejong Univ., ROK)
8-5	Development of Place Recommendation Engine(PRE) based on color psychology analysis of user SNS using K-NN
	Sohee Lee, Huibeom Kim, Seunghyun Lee (Jeju National Univ., ROK)
8-6	Development of the YOGO mobile application for global collaboration
	Sangwoo Yang, SeungDeok Kim, SangKwon Yeum, Jiwoong Yang, HyeYeon Jeong, Seunghyun Lee (Jeju National Univ., ROK)

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Session 8: Interactive Presentation Session I (Room 2)	
13:40-15:10, Mon, June 20, 2022	Chair: Dr. Seokhoon Kim (Soonchunhyang Univ., ROK)
8-7	AI-based user-customized tourist destination recommendation program tourism products using AR VR system
	Hyeok Kang, Jimin Kim, Haenam Eun, Dongho Yang (Jeju National Univ., ROK)
8-8	A Study on the Road Technology Policy Establishment through Analysis of Potential Technology Level
	Yongwon Kim, Jiho Park (Korea Expressway Corporation Research Institute, ROK)
8-9	Trend Analysis and Implications Autonomous Driving System
	Yongwon Kim, Hyeon-Joung Kim (Korea Expressway Corporation Research Institute, ROK)

Session 9: Future Information Security II (Room 3) 13:40-15:10, Mon, June 20, 2022	Chair: Dr. Byungseok Min (Xavis Co., Ltd, ROK)
9-1	Derivation of Attack Graph and Risk Indicator for Smart Factory Attack Analysis
	In-Su Jung, Jin Kwak (Ajou Univ., ROK)
9-2	Consensus Algorithm-based Decentralized Authorization Method for Contract Account Management in DeFi Platform
	Yu-Rae Song, Minkyung Lee, Jin Kwak (Ajou Univ., ROK)
9-3	Qiskit Optimization Algorithm-based Quantum Circuit for Solving Knapsack Problem
	Juon Kim (Korea Univ., ROK), Aeyoung Kim (Hanshin Univ., ROK)
9-4	Frequency Visualization Model for Stuxnet Attack Prevention
	Eui-Jin Kim, Jin Kwak (Ajou Univ., ROK)
9-5	A Study on the Analysis of Security Threats for Controllers in the Renewable Energy System
	Min Gyu Lee, Jung Taek Seo (Gachon Univ., ROK)
9-6	Development of Cyber Attack Scenarios for Nuclear Power Plants Using Security Threat Knowledgebase
	ChangHyun Roh, JungTaek Seo (Gachon Univ., ROK)

Session 10: Digital Forensics (Room 1) 15:20-17:30, Mon, June 20, 2022	Chair: Dr. Imran Ghani (Virginia Military Institute, USA)
10-1	Study on the Standard Components of Digital Forensics Laboratories
	Sumin Shin, Jaewon Hong, Gibum Kim (Sungkyunkwan Univ., ROK)
10-2	Artifact Analysis of Cryptocurrency Wallet
	Hyeonmin Park, Hyeon Kwon, Hayonng Kim, Jeawon Hong, Dongwook Kim, Gibum Kim (Sungkyunkwan Univ., ROK)
10-3	Technical Limitations of Device Decryption and Legal Countermeasures
	Jiyeon Joo, Sojung Oh, Chohee Bae, Sohyun Joo, Kyunglyul Lee (Sungkyunkwan Univ., ROK)
10-4	Tracking on Usage of Dropbox with $MFT Timestamp Pattern Analysis
	Hyeon Kwon, Eun Jin Kim, Hee Won Park, Sung Jin Lee, Gi Bum Kim (Sungkyunkwan Univ., ROK)

Session 11: Interactive Presentation Session II (Room 2) 15:20-17:30, Mon, June 20, 2022	Chair: Dr. Kwanghoon Pio Kim (Kyonggi Univ., ROK)
11-1	Mobility-aware Digital Twin Migration Scheme
	Yeunwoong Kyung (Hanshin Univ., ROK), Juyoung Park (Samsung Electronics, ROK), Youngjun Kim (Korea Univ., ROK), Taewon Song (Soonchunhyang Univ., ROK)
11-2	An investigation on hybrid feature selection based on impurity and LIME feature importance
	Chae-Yoon Lee (Hanshin Univ., ROK), Minjae Park (Daelim Univ., College, ROK), Yonggeol Lee, Jeongwook Seo, Mingoo Kang, Hyun Ahn (Hanshin Univ., ROK)
11-3	A Methodology for Raw Data Ingestion of Battery Energy Storage System Based on Modbus TCP
	Changwoo Kim, Hyosub Choi (Korea Electronics Technology Institute, ROK)
11-4	Feature Space-based KNN Missing Value Imputation for Sensor Array
	JeongMin Park, Siyoon Kim, Hyun Ahn, Jeongwook Seo, Min-Goo Kang, Yonggeol Lee (Hanshin Univ., ROK)
11-5	Design feature optimization using autoencoder base multivariate correlation for anomaly detection
	Gun-Yoon Shin, Dong-Wook Kim, Sung-Sam Hong, Myung-Mook Han (Gachon Univ., ROK)
11-6	Attention-based LSTM for Robust Daily Activity Recognition from Smart Home Sensor Data
	Md. Zia Uddin (SINTEF AS, Norway), Jaehyoun Kim (Sungkyunkwan Univ., ROK)

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Session 11: Interactive Presentation Session II (Room 2) 15:20-17:30, Mon, June 20, 2022	Chair: Dr. Kwanghoon Pio Kim (Kyonggi Univ., ROK)
11-7	Facial Emotion Recognition in lightweight environment
	Joohyung Lee, Seho Park, Kyung-Taek Lee (Korea Electronics Technology Institute, ROK)
11-8	Attack vectors risk modeling study in IoT environment
	Jeongdo Lee, Pusik Park (Korea Electronics Technology Institute, ROK)
11-9	A Study on Implementation Process of Block Chain Based Contract Management System
	Sunghwan Kim (Tech University of Korea, ROK)

Session 12: Multimedia / Image Processing / HCI / Intelligent Systems I (Room 3) 15:20-17:30, Mon, June 20, 2022	Chair: Dr. Soo-Kyun Kim (Jeju National Univ., ROK)
12-1	Parallel Implementations of Digital Focus Indices Based on Minimax Search Using Multi-core Processors
	HyungTae Kim, Duk-Yeon Lee, Dongwoon Choi, Jaehyeon Kang, Dong-Wook Lee (Korea Institute of Industrial Technology, ROK)
12-2	Executability Evaluation of Automatic Authentication Supported Medical Information Platform Applying Edge Computing, Big Data Processing, and AI Model
	Gyu-Sung Ham (Wonkwang Univ., ROK), Mingoo Kang (Hanshin Univ., ROK), Su-Chong Joo (Wonkwang Univ., ROK)
12-3	Personal Driving Style based ADAS Customization using Machine Learning for Public Driving Safety
	Giyoung Hwang, Dongjun Jung, Yunyeong Goh, Jong-Moon Chung (Yonsei Univ., ROK)
12-4	Optimization of deformable objects using compute shader and barycentric coordinate
	Jun Ma, Lyudmila Dmitrievna Khan, Min Hong (Soonchunhyang Univ., ROK)
12-5	3D Facial Feature Vector and Feature Value Extraction using PCA and LPP
	Jee-Sic Hur, Hyeong-Geun Lee, Jin-Woong Kim, Dongho Yang (Jeju National Univ., ROK), Shin-Jin Kang (Hongik Univ., ROK), Soo Kyun Kim (Jeju National Univ., ROK)
12-6	Explainable Artificial Intelligence Based Gender Classification
	Minsol Park, Yongmin Song, Inseop Na (Chosun Univ., ROK)
12-7	Design and Implementation of B2B Matching Platform Using Job Shop Scheduling System for Textile SMEs
	Yeonjee Choi, Xiaorui Shao, Chang Soo Kim (Pukyong National Univ., ROK)

Session 13: AI and Big Data Technologies for Crime Prevention I (Room 1) 09:00-10:30, Tue, June 21, 2022	Chair: Dr. Kyung-Hee Sun (Kyonggi Univ., ROK)
13-1	School Violence Prevention and Patrol Activities Using Uniform Classification Technology
	Myeonggi Hong (Kyonggi Univ., ROK), YuJung Cha (Graduate School of Police Studies, ROK), JunHo Park, EuiGab Hwang, JeongHyeon Chang (Kyonggi Univ., ROK)
13-2	Keyword Analysis using Text Mining on Judicial Precedent Text Data
	YeaEun Lee, JeongHyeon Jang, KyungHee Sun, JooChang Kim (Kyonggi Univ., ROK)
13-3	Improving Video Surveillance System with Recursively Interpolated Dense Video
	Hyunbin Kim, Junchul Chun (Kyonggi Univ., ROK)
13-4	Cam-based Aviation Hazardous Material Classification Model using Attention Mechanism
	Hye-Jeong Kwon, Da-Kyoung Hong, So-Eun Choi, Byeong-Uk Jeon, Seo-El Lee, Kyungyong Chung (Kyonggi Univ., ROK)
13-5	Pedestrian Risk Detection Method using Word Representation
	Min-Jeong Kim, Byeong-Uk Jeon, Hyun Yoo, Kyungyong Chung (Kyonggi Univ., ROK)
13-6	Multi-Scale Feature Extraction and GANomaly-Based Audio Anomaly Detection Model for Crime Prevention
	Byeong-Uk Jeon, Ye-Yeon Kang, Ji-Won Baek, Hyun Yoo, Kyungyong Chung (Kyonggi Univ., ROK)

Session 14: Multimedia / Image Processing / HCI / Intelligent Systems II (Room 2) 09:00-10:30, Tue, June 21, 2022	Chair: Dr. Chang Soo Kim (Pukyong National Univ., ROK)
14-1	Automated X-ray inspection on overlapping BGA Ball and Void Detection
	Giang ND, Nhan NT (XavisTech JSC, Vietnam), HC Kim, B Min (Xavis Co., Ltd, ROK), OS Lee (XavisTech JSC, Vietnam)
14-2	A Survey on Artificial Intelligence based Hand Gesture Recognition Systems
	Afsa Riaz, Fariha Naeem, Isma Farah Siddiqui (Mehran Univ. of Engineering & Technology, Pakistan)
14-3	Comparative learning of preprocessing process for chest ct deep learning
	Sungjin Lee, Beanbonyka Rim (Soonchunhyang Univ., ROK), Xibin Jia (Beijing Univ. of Technology, China), Ahyoung Lee (Kennesaw State Univ., USA), Min Hong (Soonchunhyang Univ., ROK)
14-4	Face Detection and SMS Notification Using Python and Flutter
	Pooja Kumari, Shahzad Panhwar, Isma Farah Siddiqui (Mehran Univ. of Engineering & Technology, Pakistan)
14-5	Prediction In-Hospital Cardiac Arrest within 8 Hours Using Electronics Health Records
	Minsu Chae (Korea Univ., ROK), Hyo-Wook Gil (Soonchunhyang Univ., ROK), HwaMin Lee (Korea Univ., ROK)
14-6	Integration of Augmented Reality and Motion Capture in Interactive Telehealth and Physical Rehabilitation
	Imran Ghani, Samuel Estes (Virginia Military Institute, USA), Seung Ryul Jeong (Kookmin Univ., ROK), Israr Ghani (Universiti Teknologi Malaysia, Malaysia)

Session 15: Wireless and Sensor Network / Security & Privacy in Internet & IoT (Internet of Things) / Machine to Machine & SW Challenges (Undergraduate Students) (Room 3) Chair: Dr. Yeunwoong Kyung (Hanshin Univ., ROK) 09:00-10:30, Tue, June 21, 2022	
15-1	Network Security Situation Assessment with Convolutional Autoencoder and LSTM
	Lelisa Adeba Jilcha, Deuk-Hun Kim, Jin Kwak (Ajou Univ., ROK)
15-2	Q-Learning based Collision Avoidance for Congested Wireless LANs
	JunSeok Kim, Chang Kyu Lee, Seung Hyong Rhee (Kwangwoon Univ., ROK)
15-3	A Q-Learning Method for Energy Saving in 802.11 Stations with Delay Requirements
	Dong Hyun Lee, Chang Kyu Lee, Seung Hyong Rhee (Kwangwoon Univ., ROK)
15-4	AI Powered Assistants: A thorough dive into the world of Virtual Assistants
	Palwasha Imran, Marya Baloch, Isma Farah Siddiqui (Mehran Univ. of Engineering and Technology, Pakistan)
15-5	Rehabilitative Manual Therapy Pressure Quantification Pilot Study
	Eun Hye Jo, Young Kim, Jong Gab Ho, Seungwan Jang, Se Dong Min (Soonchunhyang Univ., ROK)
15-6	A Time-Series Event-Process Mining Algorithm in Data-Intensive Digital Twin Operationalization Frameworks of IoT-driven Smart Factories
	Hyoung-Soo Kim, Hyeon-Tae Son, Won-Jae Lee, Ji-Seon Kim, So-Yeon Kim, Jae-Hyung Park, Hye-Soo Hwang, Nan-Young Kim, Hye-Bin Gu, Soek-Ho Moon, Seon-Hwi Kim, Kwanghoon Pio Kim (Kyonggi Univ., ROK)

Session 16: Software Engineering & Architecture / Cloud Computing (Room 4) 09:00-10:30, Tue, June 21, 2022	Chair: Dr. Jang Hyun Kim (Sungkyunkwan Univ., ROK)
16-1	Synthesizing Control Algorithm in GR(1) Specification for System Theoretic Hazard Analysis
	Daehui Jeong, Jungwoo Park ,Myongho Kim (Hancom Intelligence, ROK), Gihwon Kwon (Kyounggi Univ., ROK)
16-2	Redundancy Reduction Technique for Test Case Selection in Regression Testing
	Israr Ghani, Wan M.N. Wan-Kadir, Adila Firdaus Arbain (Universiti Teknologi Malaysia, Malaysia)
16-3	Microservice-based Open Service Platform for Domain-cross ICT Convergence
	Kyounghyun Park, Woojin Kim, Ji Sang Park, Daesub Yoon (Electronics and Telecommunications Research Institute, ROK)
16-4	An Implementation of Observer Design Pattern for Data Replication between Instances of Multiple Clouds through HTTP Tunneling
	Mir Muhammad Suleman Sarwar, Javier Jose Diaz Rivera, Talha Ahmed Khan, Afaq Muhammad, Wang-Cheol Song (Jeju National Univ., ROK)
16-5	Volume constraint implementation using PBD-based in Unity3D
	Do-kyeong Lee, Hongly Va, Min Hong (Soonchunhyang Univ., ROK)

Session 17: AI and Big Data Technologies for Crime Prevention II (Room 1) 10:40-12:10, Tue, June 21, 2022	Chair: Dr. Jeong-Hyun Chang (Kyonggi Univ., ROK)
17-1	Knowledge Graph based on Object Detection for Arson Crime Prediction
	Ji-Won Baek, Geon Park, Min-Jeong Kim, Hye-Jeong Kwon, Kyungyong Chung (Kyonggi Univ., ROK)
17-2	An Interactive and Stepwise Visual Emulator for Executing and Visualizing the Micro-Instructional Operations of SIC-Machine Language Programs
	Young-In Park, Kwanghoon Pio Kim (Kyonggi Univ., ROK)
17-3	Image classification criteria as deep learning data for pose detection
	Eunbi Cho, Jeong-hyeon Chang, Hyun Yoo, Seoel Lee (Kyonggi Univ., ROK)
17-4	Osteoarthritis classification of radiographic images using the Xception model
	Sang-min Lee, Namgi Kim (Kyonggi Univ., ROK)
17-5	A Deep Learning-based Video Management System for Privacy-Preserving CCTV Video Data over The Web Environment
	Dinh-Lam Pham, Joo-chang Kim, Sang-eun Ahn, Yae-Eun Lee, Jeong-Hyun Chang, Hyun Yoo, Kyonghee Sun, Kyong-Sook Kim, Kwanghoon Pio Kim (Kyonggi Univ., ROK)
17-6	An Active and Contextual Video-Object Bigdata Acquisition Framework
	Kyung-Hee Sun, Hyun Yoo, Jeong-Hyun Chang, Dinh-Lam Pham, Joo-Chang Kim, Kyoung-Sook Kim, Sang-Eun Ahn, Kwanghoon Pio Kim (Kyonggi Univ., ROK)

Session 18: IoT (Internet of Things) / Machine to Machine (Room 2) 10:40-12:10, Tue, June 21, 2022	Chair: Dr. Yeunwoong Kyung (Hanshin Univ., ROK)
18-1	Mobility-based Efficient Wireless Power Transfer Scheme using Electric Vehicles
	Yunjong Yu, Yeunwoong Kyung (Hanshin Univ., ROK)
18-2	IoT-Aided Biometric Data Ingestion for Creating Digital Humans in the Metaverse
	Seung-mi Ham, Young-woo Lee, Min-goo Kang, Chang-kyo Lee, Jeongwook Seo (Hanshin Univ., ROK)
18-3	Cyber Security Threats and Countermeasures in Marine Ship Environment
	JaeHyuck Choi, Jung Taek Seo (Gachon Univ., ROK)
18-4	A Study on Log Collection to Analysis Cause of Malware Infection of IoT Devices in Smart City Environment
	Dong Hyun Kim, Jung Taek Seo (Gachon Univ., ROK)
18-5	Development of IoT Device Security Requirements through Malicious Code Attack Case Analysis and Vulnerability Mapping
	Hojun Jin, Jung Taek Seo (Gachon Univ., ROK)

Session 19: ICT Standardizations (Room 3) 10:40-12:10, Tue, June 21, 2022	Chair: Dr. Kanghae Lee (TTA, ROK)
19-1	Out-of-band mutual authentication standardization by combining mobile biometric authentication with out-of-band server authentication in ITU-T SG17
	Jonghyun Woo (DualAuth Co. Ltd., ROK), Haksu Lee (Chung-Ang Univ., ROK), Wanjoo Pyun, Insoo Kim (eSTORM Co. Ltd., ROK), Sujung Park, Kanghae Lee (Telecommunications Technology Association, ROK)
19-2	ICT Standard Activities for Drone of Things
	Naqqash Dilshad, JaeSeung Song (Sejong Univ., ROK)
19-3	A Study on the Mobile Forensic Image Production Process
	Eunjin Kim, Sojung Oh, Heewon Park (Sungkyunkwan Univ., ROK), Yeong-seong Kim (Telecommunications Technology Association, ROK), Gibum Kim (Sungkyunkwan Univ., ROK)

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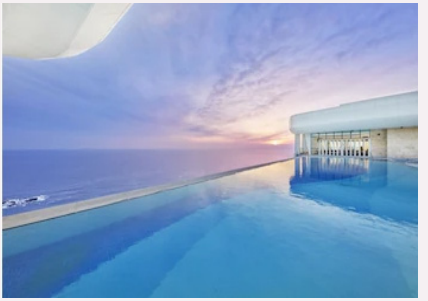

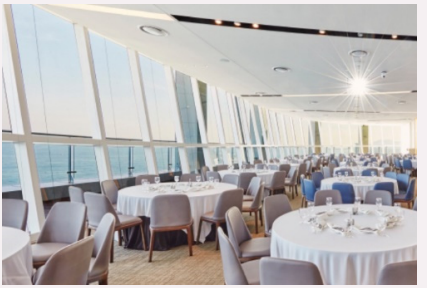

| Conference contact |

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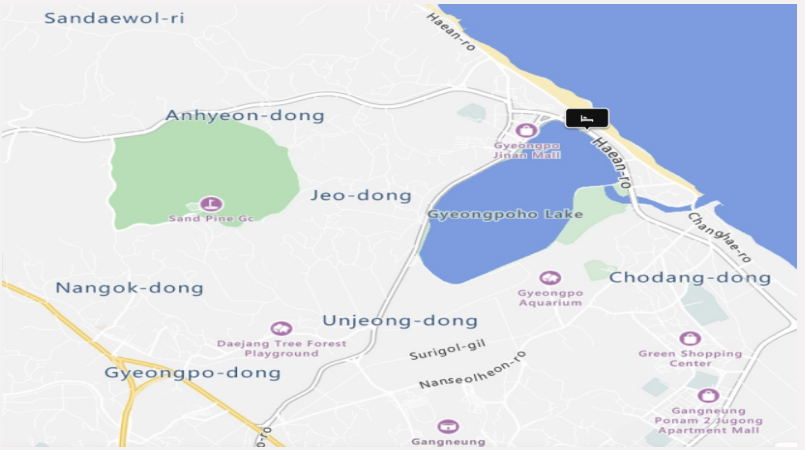

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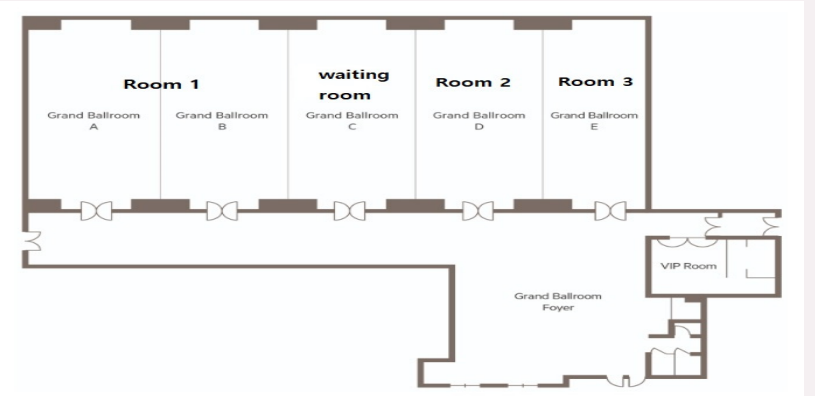

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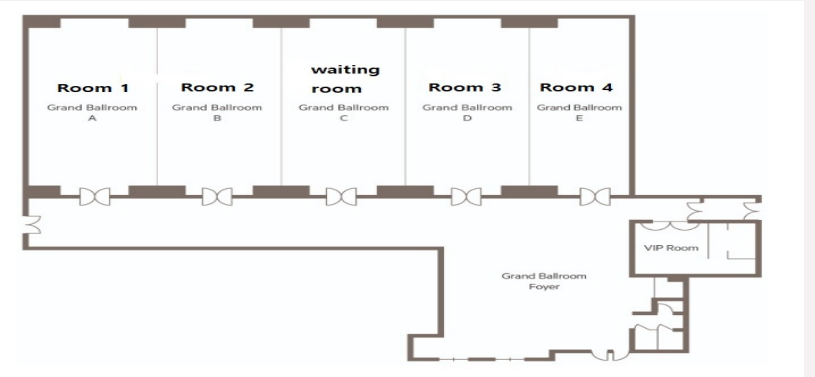

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