KSII **KOREAN SOCIETY FOR INTERNET INFORMATION**

The 16th Asia Pacific International Conference on Information Science and Technology
(APIC-IST 2021)

June 20-22, 2021, Paradise Hotel Busan, Korea
http://www.apicist.org/2021

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 16th Asia Pacific International Conference on Information Science and Technology (APIC-IST 2021) that will be held from June 20~22, 2021 in Paradise Hotel, Busan, 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 21 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 2021 truly represent the comprehensiveness of this conference. We are sure that APIC-IST 2021 will provide you with a wealth of information and many opportunities for future discussion.

Many people have worked hard to make APIC 2021 successful. A variety of conference arrangements and special events as well as well organized program have been prepared by the Conference Chair Prof. Jongho Paik (Seoul Women's Univ., ROK), Program Chairs Prof. Inseop Na (Chosun Univ., ROK), Prof. Imran Ghani (Indiana Univ. of Pennsylvania, USA). I also express my special thanks to the Keynote Speaker, Dr. Cheol- il Lim who is Seoul National University, Korea.

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 16th APIC-IST 2021 a success! I wish a great success in their future endeavor and look forward to meeting you all again at ICONI 2021 that will be held on December Jeju Island, Korea.

Dr. Jaehyoun Kim

Honorary Chair of APIC-IST 2021

A Message from Conference Chair

Welcome to the 16th Asia Pacific International Conference on Information Science and Technology (APIC-IST 2021). which will be held on June 20-21, 2021, at Paradise hotel, Busan, 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 / Software Convergence for Well-Life.

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 2021 offers 1 invited talks, 17 sessions and a special workshop that present the latest results in various research fields of ICT (Information Communication Technology). I would like to thank to Dr. Cheol- il Lim for keynote speech participation.

I must thank to all the authors and speakers for the research papers on their precious achievements. Busan, 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. Jongho Paik
Seoul Women's
University, ROK

Dr. Jongho Paik
Conference Chair of APIC-IST 2021

A Message from Program Chairs

It is a pleasure to welcome you to the 16th Asia Pacific International Conference on Information Science and Technology (APIC-IST 2021). The APIC-IST 2021 will be held at Busan, Korea on June 20-22. 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 16 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.

Although it is a difficult time to visit abroad due to the COVID-19, we decided to hold APIC-IST 2021 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 2021 Program Committee organizes as a set of thirteen(13) tracks and welcomes presentations of completed research papers as well as research-in-progress papers, panel discussion, and posters covering those issues.

The successful organization of APIC-IST has required the talents, dedication and time of many volunteers from USA, China, Australia, Pakistan, Malaysia, Nepal, Philippines and Republic of Korea. Special gratitude and appreciation go to Dr. Jaehyoun Kim, Dr. Jongho Paik 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 104 papers will be presented at APIC-IST 2021. We would like to thank to all the authors and speakers for submitting and presenting their valuable research papers at APIC-IST 2021.

Dr. Inseop Na   Dr. Imran Ghani
Program Chairs of APIC-IST 2021

Dr. Inseop Na
Chosun University, ROK

Dr. Imran Ghani
Indiana Univ. of Pennsylvania, USA

Keynote Speaker

Keynote Speaker   Dr. Cheol- il Lim

Department of Education, Seoul National University, Korea

Title: Instructional Design Perspective for Software Education

Abstract of the talk:

Although computer software such as Python and Entry has been in-demand and taught at various educational institutions catered toward multiple levels, ranging from primary schools to post-secondary, many learners face difficulty completing their programs, thus resulting in a significant dropout rate. This presentation will provide three educational interventions from the instructional design approach of educational technology. First, instructional systems design (ISD), especially the rapid prototyping to instructional systems design (RPISD) model, will be introduced as a framework for designing effective programs. The RPISD model relies on a holistic and systematic approach to align analysis, design, and evaluation activities, in which rapid prototyping and usability testing are critical components. Second, the simplifying condition method (SCM) will be presented as a tool for analyzing the learning tasks and sequencing them to help learners understand the content and become more motivated in the education process. Third, an integrated approach with the subject matter, such as science or mathematics, will be suggested to make software education more applicable in practical contexts. Each intervention will be discussed with instances of educational programs.

Short Bio :

Cheolil Lim is a professor at the Department of Education and the director of the Center for the Innovation of Future Education, both at Seoul National University. He is also currently serving as the president of the Academy of Creativity. He has served in various other positions such as the president of the Korean Society for Educational Technology and the chair of the Department of Education of Seoul National University among many others. His research interests center around creativity education, instructional design, e-learning, and convergence education. He has also authored and/or co-authored over 100+ journals related to rapid prototyping to instructional systems design, education programs for converging software and subject matters, and creativity development in prestigious academic peer-reviewed journals such as the Journal of Educational Technology, Educational Technology Research & Development, and the Asia Pacific Education Review. He received his Ph.D. in Instructional Systems Technology from the School of Education at Indiana University and his master's and bachelor degrees in Education from Seoul National University.

Organizing Committee

| Honorary Chair |
Jaehyoun Kim, Sungkyunkwan Univ., ROK

| Conference Chair |
Jongho Paik , Seoul Women's Univ., ROK

| Program Chairs |
Inseop Na, Chosun Univ., ROK   **Imran Ghani**, Indiana Univ. of Pennsylvania, USA

| Publication Chairs |
Min Hong, Soonchunhyang, Univ., ROK   **Jong-Moon Chung**, Yonsei Univ., ROK

| Financial Chairs |
Sangmin Lee, CHA Univ., ROK   **Myung-Mook Han**, Gachon Univ., ROK

| Workshop Chair |
Kiwon Kwon, KETI, ROK

| Steering Chairs |

Seung Ryul Jeong, Kookmin Univ., ROK
Mingoo Kang, Hanshin Univ., ROK
Junchul Chun, Kyonggi Univ., ROK
Jun Hwang, Seoul Women's Univ., ROK
Sung Y. Shin, South Dakota State Univ., USA
Namgi Kim, Kyonggi Univ., ROK
Min-Hyung Choi, Univ. of Colorado Denver, USA
Jaewan Lee, Kunsan National Univ., ROK
Yanfeng Sun, Beijing Univ. of Technology, China
Kwanghoon Pio Kim, Kyonggi Univ., ROK
Chang Soo Kim, Pukyong National Univ., ROK
Seok-Pil Lee, Sangmyung Univ., ROK
Zhiming Ding, Chinese Academy of Sciences Software Institute, China
Yongjin Kwon, Korea Aerospace Univ., ROK

Organizing Committee

| Program Committee |

Ah Young Lee, Univ. of South Dakota, USA

Byungjeong Lee, Univ. of Seoul, ROK

Jinlian Du, Beijing Univ. of Technology, China

Chi-Yuan Chen, National Ilan Univ., Taiwan

Deepanjal Shrestha, Pokhara Univ., Nepal

Wei Ma, Beijing Univ. of Technology, China

Md. Zia Uddin, Univ. of Oslo, Norway

Minho Jo, Korea Univ., ROK

Roy Morien, Naresuan Univ., Thailand

Xing Su, Beijing Univ. of Technology, China

Jihwan Kim, Sogang Univ., ROK

Woochan Lee, Incheon National Univ., ROK

Tong Li, Beijing Univ. of Technology, China

Taejin Lee, Hoseo Univ., ROK

Seungwon Kim, Chonnam National Univ., ROK

Sovila Srun, Royal Univ. of Penh, Cambodia

Dongseong Kim, Univ. of Queensland, Australia

Julian Jang-Jaccard, Massey Univ., New Zealand

Liming Guo, Beijing Univ. of Technology, China

Seon Man Kim, Korea Photonics Tech. Inst., ROK

Junho Ahn, Korea National Univ. of Trans., ROK

Beomjin Kim, Purdue Univ. Fort Wayne, USA

Woochun Jun, Seoul National Univ. of Edu., ROK

Paisarn Muneesawang, Naresuan Univ., Thailand

Juncheng Chen, Beijing Univ. of Tech., China

Shingchern D. You, National Taipei Univ. of Technology, Taiwan

Isma Farah Siddiqui, Mehran Univ. of Eng. & Tech., Pakistan

Yoo-Joo Choi, Seoul Media Institute of Technology., ROK

Bobby D. Gerarado, West Visayas State Univ., Philippines

Ahmad Sharif, Universiti Teknologi Malaysia, Malaysia

Wahidah Husain, Univ. of Sains Malaysia, Malaysia

Liang Yi, Beijing Univ. of Technology, China

HwaMin Lee, Soonchunhyang Univ., ROK

Soo-Kyun Kim, Jeju National Univ., ROK

Jeongwook Seo, Hanshin Univ., ROK

Jin Kwak, Ajou Univ., ROK

Keun-Ho Lee, Baekseok Univ., ROK

Zhi Cai, Beijing Univ. of Technology, China

DongKyoo Shin, Sejong Univ., ROK

Jongchang Ahn, Hanyang Univ., ROK

Yoosin Kim, Alticast, ROK

Moonseong Kim, Seoul Theological Univ., ROK

Wangcheol Song, Jeju National Univ., ROK

Jong-Hyouk Lee, Sejong Univ., ROK

Soon Ja Yeom, Univ. of Tasmania, Australia

Woochan Lee, Incheon National Univ., ROK

Seokhoon Kim, Soonchunhyang Univ., ROK

Conference Program

Sun / Jun. 20, 2021	Room 1
16:00-18:00	VIP Reception & Greetings

Mon / Jun. 21, 2021	Room 1 (Capri)	Room 2 (Miami)	Room 3 (Venice)
08:30-	Registration (2F)		
09:00-10:30	Session 1	Session 2	Session 3
10:40-11:10	Opening Ceremony & Keynote Speech / Capri Room		
11:20-12:20	Session 4	Session 5	Session 6
12:30-13:30	Lunch (11:30-13:30) / Grand Ballroom		
14:00-15:30	Session 7	Session 8	Session 9
15:40-17:30	Session 10	Session 11	
18:00-19:30	Award Ceremony & Banquet / Grand Ballroom		

Tue / Jun. 22, 2021	Room 1 (Capri)	Room 2 (Miami)	Room 3 (Venice)
08:30-	Registration (2F)		
09:00-10:30	Session 12	Session 13	Session 14
10:40-12:10	Session 15	Session 16	Session 17
12:30-13:30	Lunch / Grand Ballroom		
14:00-15:30	Panel Discussion: Collaborative Research		

http://apicist.org/2021

Conference Program

Sun, June 20, 2021

16:00-18:00	VIP Reception & Greetings

Mon, June 21, 2021

09:00-10:30	Session 1: Smart Phone Applications and Service / Mobile Internet Computing & Management of Internet Application / E-Business / E-Commerce
	Session 2: Multimedia / Image Processing / HCI / Intelligent Systems I
	Session 3: Future Information Security & Software Engineering & Architecture / Cloud Computing

10:40-11:10	Opening Ceremony & Keynote Speech

11:20-12:20	Session 4: Wireless and Sensor Network / Security & Privacy in Internet & Software Engineering & Architecture / Cloud Computing
	Session 5: IoT(Internet of Things) / Machine to Machine/ & Software Engineering & Architecture / Cloud Computing
	Session 6:Database / Data Mining / Big Data / Mobile Object Database I

12:30-13:30	Lunch (11:30-13:30)

Conference Program

Mon, June 21, 2021

14:00-15:30	Session 7: Multimedia / Image Processing / HCI / Intelligent Systems II
	Session 8: Multimedia / Image Processing / HCI / Intelligent Systems III
	Session 9: Database / Data Mining / Big Data / Mobile Object Database II

| 15:40-17:30 | Session 10: AI Application for Internet and Information |
| | Session 11: Software Convergence for Well-Life |

| 18:00-19:30 | Award Ceremony & Banquet |

Tue, June 22, 2021

09:00-10:30	Session 12: KETI Workshop I
	Session 13: Interactive Presentation Session I
	Session 14: Interactive Presentation Session II

Conference Program

Tue, June 22, 2021

10:40-12:10	Session 15: KETI Workshop II
	Session 16: Interactive Presentation Session III
	Session 17: Interactive Presentation Session IV

12:30-13:30	Lunch

14:00-15:30	Panel Discussion: Collaborative Research

* Presentation Time

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

Conference Program

Session 1: Smart Phone Applications and Service / Mobile Internet Computing & Management of Internet Application / E-Business / E-Commerce (Room 1 / Capri)

Chair: Dr. Min Hong (Soonchunhyang Univ., ROK)

09:00-10:30, Mon, June 21, 2021

1-1	Spherical Image Viewer based on Standard JPEG360 metadata
	Iqbal Yasir, Kwon Oh-Jin, Faiz Ullah (Sejong Univ., ROK)
1-2	5G Service Orchestration and Assurance for UAVs: A Blockchain-Driven Approach
	Talha Ahmed Khan, Afaq Muhammad, Khizar Abbas, Wang-Cheol Song (Jeju National Univ., ROK)
1-3	A Formal Practical Overview of Android Permission System
	Hina Hussain, Isma Farah Siddiqui, Qasim Ali Arain (Mehran Univ. of Engineering & Technology, Pakistan)
1-4	Exploring user experience via Bi-LSTM analysis and semantic network analysis: A case of mobile games
	Haein Lee, Jang Hyun Kim (Sungkyunkwan Univ., ROK)
1-5	Factors Influencing User Behavior on an Online Education Platform Based on B2B2C Mode: From the Perspective of Art Education
	Shao Peng Hou, Jongchang Ahn (Hanyang Univ., ROK)
1-6	Artifacts and Design Considerations for Digital Tourism Business Ecosystem
	Deepanjal Shrestha, Tan Wenan (Nanjing Univ. of Aeronautics & Astronautics, China), Bikram Adhikari (Genese Solution, Nepal), Deepmala Shrestha (Pokhara Univ., Napal), Seung Ryul Jeong (Kookmin Univ., ROK)

Conference Program

| 09:00-10:30, Mon, June 21, 2021 |

Session 2: Multimedia / Image Processing / HCI / Intelligent Systems I (Room 2 / Miami)

Chair: Dr. Jun-Ki Hong (Pai Chai Univ., ROK)

09:00-10:30, Mon, June 21, 2021

2-1	Applying Game Design and Metaverse Concepts to Promote Soft Skills
	Edward Shin, Jang Hyun Kim (Sungkyunkwan Univ., ROK)
2-2	A CNN-LSTM Model for Alzheimer's Disease Multi-Class Classification using Multichannel EEG
	Thi Kieu Khanh Ho, Hyunseok Lim, Jaeyong Kang, Jong-In Song, Jeonghwan Gwak (Korea National Univ. of Transportation, ROK)
2-3	Frequency Landmark Selection using CNN-based Heat Map for Voice Emotion Prediction
	Hyun Yoo, Ji-Won Baek, Ji-Soo Kang, Kyungyong Chung (Kyonggi Univ., ROK)
2-4	Detection Technique of Suspected Copyright Infringement Sites using Advertisement Banner Image URL
	Tae Jun Lee, Hae-Seon Jeong, Jin Kwak (Ajou Univ., ROK)
2-5	Two Remote Collaboration Styles
	Seungwon Kim (Chonnam National Univ., ROK), In Seop Na (Chosun Univ., ROK)
2-6	A Multiple CNN Hand Motion Classifier with a Dynamic Threshold Method for Motion Extraction Using EF Sensors
	Hun Min Lee (Geogia State Univ., USA), In Seop Na (Chosun Univ., ROK), Youngchul Kim (Chonnam National Univ., ROK)

Conference Program

Session 3: Future Information Security & Software Engineering & Architecture / Cloud Computing (Room 3 / Venice)

09:00-10:30, Mon, June 21, 2021　　　　　　　　　**Chair: Dr. Seokhoon Kim (Soonchunhyang Univ., ROK)**

3-1	A study on the classification of Cyber Operational Elements for Cyber Command and Control Decision-Making Support System Dong-Hwan Lee, Sukjoon Yoon, Kookjin Kim, JiWon Kang (Sejong Univ., ROK), Haengrok Oh, Jungsik Lee (ADD, ROK), Dongkyoo Shin (Sejong Univ., ROK)
3-2	A New Approach for Responding Complexity of Blended Threat Minkyung Lee, Deuk-Hun Kim, Jin Kwak (Ajou Univ., ROK)
3-3	Research on Cyber ISR Visualization Method based on BGP Archive Data through Hacking Case Analysis of North Korean Cyber-Attack Groups Jaepil Youn (Sejong Univ., ROK), Daeyoung Kang (Ajou Univ., ROK), GwangHyun Ahn, Dongkyoo Shin (Sejong Univ., ROK)
3-4	A Study on Quantitative Validation Method for Cyber-Threat Response System based on Military IT Environment Jung-sik Lee, Haengrok Oh (Agency for Defense Development, ROK), Dong-Wook Kim, Myung-Mook Han (Gachon Univ., ROK)
3-5	Access Control, Attribute-Based Encryption, Searchable Encryption in Cloud Computing: A critical review Van Y Pham, Soon Ja Yeom (Univ. of Tasmania, Australia), In Seop Na (Chosun Univ., ROK)
3-6	Blockchain and Impact on Current Industries Mubashra Fayyaz, Aqsa Zahid (FAST NUCES, Pakistan), Abdul Aziz (Dalian Univ. of Technology, China)

Conference Program

	Session 4: Wireless and Sensor Network / Security & Privacy in Internet & Software Engineering & Architecture / Cloud Computing (Room 1/ Capri)	
	11:20-12:20, Mon, June 21, 2021	**Chair: Dr. Myung-Mook Han** (Gachon Univ., ROK)
4-1	Massive IoT Malware Detection Technique with a LSTM using Binary Lifting	
	Hae-Seon Jeong, Deuk-Hun Kim, Jin Kwak (Ajou Univ., ROK)	
4-2	A Study on the EDR System using the Adversary Emulation Framework and OC SVM Anomaly Detection Model	
	Ji-Hoon Yoo, Keoungchan Yoon, Byeongjun Min, Dongkyoo Shin, Dongil Shin (Sejong Univ., ROK)	
4-3	Regression Anomalies Detection in Web Services	
	Muhammad Hasnain, Muhammad Fermi Pasha (Monash Univ., Malaysia), Imran Ghani (Indiana Unive. of Pennsylvania, USA), Seung Ryul Jeong (Kookmin Univ., ROK)	
4-4	Implementation of Disinfection Service Platform based on O2O (Online to Offline)	
	Hajeong Yoo, Yumin Jo, Yejin Jang, Ji In Shin, Yun Jeong Jang (Seoul Women's Univ., ROK), Jun Hwan Kim (ADRLabs, ROK), Jong Ho Paik (Seoul Women's Univ., ROK)	

Conference Program

Session 5: IoT(Internet of Things) / Machine to Machine/ & Software Engineering & Architecture / Cloud Computing (Room 2 / Miami)

Chair: Dr. Moonseong Kim
(Seoul Theological Univ., ROK)

11:20-12:20, Mon, June 21, 2021

5-1	Intelligent Abnormal Event Detection System using Activity and LiDAR Sensors
	Dohyun Lee, Dahyun Kim, Jinhee Lee, Junho Ahn (Korea National Univ. of Transportation, ROK)
5-2	Decentralized IoT Network for Artificial Intelligence Applications
	Hye-min Kwon, Min-jun Kim, Min-Goo Kang (Hanshin Univ., ROK), Yun-gi Park (KETI, ROK), Chang-kyo Lee (Gumi Electronics & Information Technology Research Institute, ROK), Hyun Ahn, Yonggeol Lee, Jeongwook Seo (Hanshin Univ., ROK)
5-3	Semantic Recommendation Approach for Task Allocation in Outsourced Software Engineering
	Umair Ayaz Kamangar, Isma Farah Siddiqui, Qasim Ali, Zainab Umair Kamangar (Mehran Univ. of Engineering & Technology,Pakistan)
5-4	Reducing the Time of Regression Testing Using Model-Based Guided Test Case Selection
	Israr Ghani, Wan M.N. Wan-Kadir, Adila Firdaus Binti Arbain, Omeed kamal Khorsheed (Univ., Technology Malaysia, Malaysia)

Conference Program

Session 6: Database / Data Mining / Big Data / Mobile Object Database I (Room 3 / Venice)

Chair: Dr. Ha Sung Hwang
(Dongguk Univ., ROK)

11:20-12:20, Mon, June 21, 2021

6-1	Analysis on Changes of Hate Crime in the United States after the COVID-19
	Jeonghun Kang (Daejeon Univ., ROK), Jeong-Hyeon Chang (Kyonggi Univ., ROK), Jung-In Seo (Halla Univ., ROK)
6-2	Study on sentiment analysis for Opera
	Harim Jeong (Sungkyunkwan Univ., ROK)
6-3	Extraction of Road Risk Factors Based on Regression Analysis to Prevent Traffic Accidents
	Min-Jeong Kim, Hye-Jeong Kwon, Ji-Soo Kang, Ji-Won Baek, Kyungyong Chung (Kyonggi Univ., ROK)
6-4	Thorax Disease Classification Using Structure Deformation Analysis based on Unsupervised Learning
	Hye-Jeong Kwon, Dong-Hoon Shin, Dong-Joon Lee, Byeong-Uk Jeon, Kyungyong Chung (Kyonggi Univ., ROK)

Conference Program

Session 7: Multimedia / Image Processing / HCI / Intelligent Systems II (Room 1 / Capri)

Chair: Dr. Kwanghoon Pio Kim
(Kyonggi Univ., ROK)

14:00-15:30, Mon, June 21, 2021

7-1	A Proposal for Streaming Method Supporting Zoom-in/out Function based on Object Information of Free Viewpoint Video
	Minjae Seo, Jong Ho Paik (Seoul Women's Univ., ROK), Gooman Park (Seoul National Univ. of Science & Technology, ROK)
7-2	Forecast of Fruit and Vegetable Yields Using Hybrid of Nonlinear Autoregressive Exogenous Network and Statistical Time Series Analysis Model
	Wan Hyun Cho, Myung-Hwan Na (Chonnam National Univ., ROK), Inseop Na (Chosun Univ., ROK), Sangkyoon Kim (Mokpo National Univ., ROK)
7-3	Machine Learning Based Illegal Advertisement Banner Identification Technique for Effective Piracy Site Detection
	Lelisa Adeba Jilcha, Jin Kwak (Ajou Univ., ROK)
7-4	Feature Integration for COVID-19 Classification using Chest Radiography
	Thi Kieu Khanh Ho, Zahid Ullah, Inki Kim, Hyunseok Lim, Jaeyong Kang, Jeonghwan Gwak (Korea National Univ. of Transportation, ROK)
7-5	COVID-19 Detection with a Semi-Supervised Adversarial Autoencoder in Chest Radiographs
	Zahid Ullah, Thi Kieu Khanh Ho, Hyunseok Lim, Jaeyong Kang, Jeonghwan Gwak (Korea National Univ. of Transportation, ROK)
7-6	AcroViR: Using Virtual Reality for the treatment of Acrophobia
	Ali Sasoli, Anmol Asghar, Isma Farah Siddiqui (Mehran Univ. of Engineering & Technology, Pakistan)

| 14:00-15:30, Mon, June 21, 2021 |

Session 8: Multimedia / Image Processing / HCI / Intelligent Systems III (Room 2 / Miami)		
14:00-15:30, Mon, June 21, 2021		Chair: Dr. Soo-Kyun Kim (Jeju National Univ., ROK)
8-1	TW3-Based Computer-Aided Bone Age Assessment System Using Deep Learning learning	
	Chansu Lee, Shi-Sub Byon (HealthHub Co. Ltd, ROK), Byoung-Dai Lee (Kyonggi Univ., ROK)	
8-2	Parallel Method for Constraint Enforcement Cloth Simulation using GLSL	
	Min-Hyung Choi (Univ. of Colorado Denver, USA), Hongly Va, Jun Ma, Min Hong (Soonchunhyang Univ., ROK)	
8-3	Orthorectification based on GPU by using Adaptive Data Partitioning for Extremely High Resolution Satellite Image	
	BoSeon Kang (Korea Univ., ROK), Seong-Soo Han (Kangwon National Univ., ROK), Chang-Sung Jeong (Korea Univ., ROK)	
8-4	LSTM-based Vibration Prediction	
	Jun-Ki Hong (Pai Chai Univ., ROK)	
8-5	Movie Genre Classification from Movie Posters Using Deep Feedforward Network	
	Badaruddin (Shah Abdul Latif Univ., Pakistan), Abdul Aziz (Dalian Univ. of Technology, China), Tuan Thanh Le (Sungkyunkwan Univ., ROK), Ghulam Mujtaba (Gachon Univ., ROK)	

Conference Program

Session 9: Database / Data Mining / Big Data / Mobile Object Database II (Room 3 / Venice)

Chair: Dr. Mingoo Kang (Hanshin Univ., ROK)

14:00-15:30, Mon, June 21, 2021

9-1	Data Stability Improvement of Random Sampling in Machine Learning
	jihun Jeong, Boseung Kwon, Seongmin Ryu, Youngshin Han, Jongsik Lee (Inha Univ., ROK)
9-2	A Functional Architecture of the SICN-oriented Process Mining System
	Young-In Park, Joo-Eun Bae, So-Hyang Park, Nguyen Thanh Hai, Dinh-Lam Pham, Kyoung-Sook Kim, Kwanghoon Pio Kim (Kyonggi Univ., ROK)
9-3	Applying LSTM To Genetic Algorithm for Solving The NP-hard JSSP
	Fuladi Shubhendu, Chang Soo Kim (Pukyong National Univ., ROK)
9-4	Exploring Users' Perceptions on AI-Based Fashion Curation Service Through Big Data Analysis
	Eunjung Shin (Yonsei Univ., ROK), Ha Sung Hwang (Dongguk Univ., ROK)
9-5	Scalable Traffic Predictive Analysis for Smart City using GPU in Big Data
	Dalyapraz Dauletbak (Indiana Univ., Bloomington, USA), Junghoon Heo, Sooyoung Kim, Yeon Pyo Kim (Softzen Co. Ltd., ROK), Jongwook Woo (California State Univ., Los Angeles, USA)
9-6	Predictive Analysis of Transaction Fraud leveraging Big Data for Deep Learning
	Priyanka Purushu (AT&T, USA), Junghoon Heo, Sooyoung Kim, Yeon Pyo Kim (Softzen, ROK), Jongwook Woo (California State Univ., Los Angeles, USA)

Conference Program

Session 10: AI Application for Internet and Information
(Room 1 / Capri)

Chair: Dr. Junho Ahn
(Korea National Univ. of
Transportation., ROK)

15:40-17:30, Mon, June 21, 2021

10-1	Untact Blood Pressure Algorithm Based on Pulse Wave Data by Radar Sensor
	JINGYAO SHI, KangYoon Lee (Gachon Univ., ROK)
10-2	SVM and Data Sanitization based VANET Jamming Detection and Adversarial Attack Defense for Autonomous Vehicle Safety
	Haeri Kim, Jong-Moon Chung (Yonsei Univ., ROK)
10-3	Enhanced Vision Tasks in Deep Learning
	Oakyoung Han, Jaehyoun Kim (Sungkyunkwan Univ., ROK)
10-4	Improving machine learning accuracy for hyperlipidemia diagnosis by using Selection of important clinical data
	Seonmin Lee, Mintae Kim, Subin Yang (Sangmyung Univ., ROK), Hakjae Kim (CLASSACT Incorporated, ROK), Taikyeong Jeong (Hallym Univ., ROK), Sungju Lee (Sangmyung Univ., ROK)
10-5	CoVEx19: An Artificial Intelligence Based Expert System for Covid-19 Treatment
	Farhan Ali Khoso, Tooba Farahim, Isma Farah Siddiqui (Mehran Univ. of Engineering & Technology, Pakistan)

Conference Program

Session 11: Software Convergence for Well-Life (Room 2 / Miami)

15:40-17:30, Mon, June 21, 2021

Chair: Dr. Moonseong Kim
(Seoul Theological Univ., ROK)

11-1	A Lightweight Network Status Awareness Scheme for Reliability Communication in Future Internet
	Sa Math, Prohim Tam, Seokhoon Kim (Soonchunhyang Univ., ROK)
11-2	When Deep Q-Learning Meets Federated Learning for Computation Offloading Decisions in Software-Defined IoT
	Prohim Tam, Sa Math, Seokhoon Kim (Soonchunhyang Univ., ROK)
11-3	A Testbed System Design to Predict Network Conditions of Multiple Network Interfaces
	Jihoon Park (Daegu Catholic Univ., ROK), SoYeon Lee (Soonchunhyang Univ., ROK), Youngchan Lee (Daegu Catholic Univ., ROK), Dae-Young Kim (Soonchunhyang Univ., ROK)
11-4	Coronary artery Calcium Detection with cropped data Using CNN models
	Xibin Jia (Beijing Univ. of Technology, China), Sungjin Lee, Beanbonyka Rim, Min Hong (Soonchunhyang Univ., ROK)
11-5	Deformable Object Simulation based on Internal Shape Preserving Constraint for Real-time PBD using Unity3D
	DoKyeong Lee (Soonchunhyang Univ., ROK), Yoo-Joo Choi, Taewon Kim (Seoul Media Institute of Technology, ROK), Khan Lyudmila, Min Hong (Soonchunhyang Univ., ROK)
11-6	Prediction In-Hospital Cardiac Arrest within 8 hours using Vital signs
	Minsu Chae, Sangwook Han, Hyo-Wook Gil, Jun Ma, Min Hong, HwaMin Lee (Soonchunhyang Univ., ROK)
11-7	Parallel Federated Learning Based on Deep Learning with Heterogeneous Domains
	Sony Peng, Yixuan Yang, Makara Mao, Doo-Soon Park (Soonchunhyang Univ., ROK)

Conference Program

| 09:00-10:30, Tue, June 22, 2021 |

Session 12: KETI Workshop I (Room 1 / Capri)

09:00-10:30, Tue, June 22, 2021　　　　　　　**Chair: Dr. Sungyoon Cho (KETI, ROK)**

12-1	Detection of acoustic feedback for online video conferencing system
	Dalwon Jang, Jaewon Lee, JongSeol Lee (KETI, ROK)
12-2	Adaptive batch scaler for FaaS-based AI application services
	Dong Hyun Hwang, Jae Gi Son, Gi Man Jeon, Dongmin Kim (KETI, ROK)
12-3	Binary Labeling Algorithm for High-Speed Processing of Maritime Floating Object Detection for Safety Service
	Hyo-Chan Lee, HyunHak Song, KiWon Kwon, SungYoon Cho (KETI, ROK), SungHyun Park, TaeHo Im (Hoseo Univ., ROK)
12-4	A study on semantic information extraction and DCAT2.0-based metadata conversion for dataset search
	Jongjin Jung, Kyungwon Kim, Guhwan Kim (KETI, ROK)
12-5	Development of active power control system for wind farms based on closed loop control
	Hyunho Ji, Taehyoung Kim, Jeongtaek Lim, Kyung Sun Ham (KETI, ROK)

Conference Program

Session 13: Interactive Presentation Session I (Room 2 / Miami)

09:00-10:30, Tue, June 22, 2021   **Chair: Dr. Kiwon Kwon (KETI, ROK)**

13-1	Reducing Edge devices' latency through Messaging queue scheduling
	Jinha Lim, Sujin Jeon, Jaegi Son, Dongmin Kim (KETI, ROK)
13-2	The effect of reducing data latency hrough DPDK in Edge Computing
	Sujin Jeon, Jinha Lim, Jaegi Son, Hyunwoo Kim, Dongmin Kim (KETI, ROK)
13-3	A Study of Image Processing Schemes for Recognizing Ornamental Fish on Quarantine Environment
	Kyungwon Park, Youngsu Ryu, Hyunhak Song, Sungyoon Cho, Kiwon Kwon (KETI, ROK)
13-4	Services gateway supporting weight virtualization unit functional services
	Young Yoon Choi, Dongmin Kim, Jaegi Son (KETI, ROK)
13-5	Indoor and outdoor environment data collection and analysis: focusing on a swine farm
	Jaewon Moon, Miseon Yu, Seungwoo Kum (KETI, ROK)
13-6	A Wind Farm Power Forecasting System based on Numerical Weather Prediction
	Taehyoung Kim, Heejin Kim, Jeongtaek Lim, Kyung Sun Ham (KETI, ROK)
13-7	Implementation of Traffic Participant Trajectory Detection Model Based on Unsupervised Learning Using Egocentric Videos of Connected Vehicles
	Changwoo Kim, Hyosub Choi (KETI, ROK)
13-8	Classification algorithms extracting driving, stopping, and parking status using sensor data generated from electronic vehicles
	HyeongGoo Kim, ChangWoo Kim, HyoSeob Choi, JeongHoon Kang (KETI, ROK)

Conference Program

| 09:00-10:30, Tue, June 22, 2021 |

Session 14: Interactive Presentation Session II (Room 3 / Venice)

09:00-10:30, Tue, June 22, 2021

Chair: Dr. Jeongwook Seo (Hanshin Univ., ROK)

14-1	Towards On-board Artificial Intelligence using Contextual feedback Algorithm in IoT
	JongGwan An, Chungjae Choe, SeongYun Kim, SeokJun Lee (KETI, ROK)
14-2	A lightweight pipeline model for data analysis on Edge IoT Devices
	Chulseoung Chae, Changwoo Kim, Jeonghoon Kang (KETI, ROK)
14-3	Implementation of 4K UHD LCOS Microdisplay Driver
	Youn-Sung Lee, Kyung-Take Lee, Jungwook Wee (KETI, ROK), Yong-Hyun Lee, Nam-Chol Song (SELCOS CO., LTD, ROK)
14-4	Structure Design of IMS-based Intelligent Hazardous Material Detection System Using Federated Learning
	Donghyun Kim, Heesong Ju, Sungyoon Cho, Yangsub Kim, Kiwon Kwon (KETI, ROK)
14-5	FPGA Implementation of the Real-time Multi-cell Li-ion Battery State-of-Charge(SOC) Monitoring System
	Minjoon Kim, Jaehyuk So, Yeon-Kug Moon (KETI, ROK)
14-6	Real-time Multi-device Wireless Control System Implementation for Interactive Platform
	Myoung-Jin Kim, Sung Hun Chae, Min-Joon Kim, Yeon Kug Moon (KETI, ROK)
14-7	Illumination System Design for Direct ToF sensor
	Young Bo Shim, Dong Hyun Lee, Yeon-Kug Moon (KETI, ROK)
14-8	Public Safety LTE based Aerial Base Station for Unmanned Vehicle Communication Networks
	Sung-Chan Choi, Jong-Hong Park, Sungwook Jung, Ilyeop Ahn (KETI, ROK)

http://apicist.org/2021

27

Conference Program

Session 15: KETI Workshop II (Room 1 / Capri)

Chair: Dr. TaeHo Im
(Hoseo Univ., ROK)

10:40-12:10, Tue, June 22, 2021

15-1	When Robot Meets IoT: Implementation with UAV Swarms
	Sungwook Jung, Wonseok Jung, Jong-hong Park, Sung-chan Choi, Il-yeop Ahn (KETI, ROK)
15-2	Task Oriented Battery Optimization for Disposable IoT Devices Minimizing QoS Loss
	Seokjun Lee, Nakmyung Sung, SeungMyeong Jeong, Seongyun Kim (KETI, ROK)
15-3	A survey of open-source frameworks for deep learning-based object detection on resource-constrained edge devices
	Chungjae Choe, SeungMyeong Jung, JongGwan An, Nakmyung Sung (KETI, ROK)
15-4	Development and Implementation of System for Interaction between Multi-user and Autonomous Vehicle via Transparent Display
	Jieun Kim, Minjoon Kim, Sunghun Chae, Yeonkug Moon (KETI, ROK)

Session 16: Interactive Presentation Session III (Room 2 /Miami)

Chair: Dr. Chang Soo Kim
(Pukyong National Univ., ROK)

10:40-12:10, Tue, June 22, 2021

16-1	A Model Retraining Method Based on Concept Drift Detection for Predicting Electric Vehicle Charging Loads
	Haesung Lee (KEPCO Research Institute, ROK), Minjae Park (Dalim Univ., ROK), Yonggeol Lee, Jeongwook Seo, Min-Goo Kang, Hyun Ahn (Hanshin Univ., ROK)
16-2	A Dirichlet-Multinomial Regression Topic Model Analysis on the Articles in Artificial Intelligence Area
	Jang Hyun Kim (Sungkyunkwan Univ., ROK)
16-3	LSH-based Hashchain Scheme with T-OTP to Improve Efficiency of Authentication in Ad-hoc CNRs with VMF
	Sang Seo, Dohoon Kim (Kyonggi Univ., ROK), Won-Gi Lim (Agency for Defense Development, ROK)
16-4	Toward for Sharing Standard Indicators of Compromise
	Dong-Wook Kim, Gun-Yoon Shin, Myung-Mook Han (Gachon Univ., ROK)
16-5	Blockchain based Reediting Video Platform for Personalized Healing with Emotion Classification
	Bobby Gerarado (West Visayas State Univ., Philipines), J.W. Seo, M.G. Kang (Hanshin Univ., ROK), Sangyep Nam (Kookje Univ., ROK), Hyunsik Kim (KETI, ROK), S.P. Hong (Hancom Secure Co.LTD, ROK)
16-6	Relationship between Gait Parameters and Body Mass Index
	Seungmin Jeong, Young Kim, Khan Lyudmila, Beanbonyka Rim, Se Dong Min (Soonchunhyang Univ., ROK)

Conference Program

Session 16: Interactive Presentation Session III (Room 2 /Miami)

**Chair: Dr. Chang Soo Kim
(Pukyong National Univ., ROK)**

10:40-12:10, Tue, June 22, 2021

16-7	A Study on the Development of an Objective Diagnosis and Solution for Facial Asymmetry based on Machine Learning
	Sohyeon Ryu, Subok Kim, Eunbin Kim, Seula Kye, Yejin Wee, Hyunwook Kim, OnSeok Lee (Soonchunhyang Univ., ROK)
16-8	Morphologically Abnormal Red Blood Cell Automatic Classification System in Microscopic Images
	Taeyeon Gil, Cho-i Moon (Soonchunhyang Univ., ROK), Sukjun Lee (Cheong ju Univ., ROK), OnSeok Lee (Soonchunhyang Univ., ROK)
16-9	Development of a System for Segmenting Nailfold Capillary in Mobile-based Microscopy Images using U-Net
	SeungPyo Choi, Jiwon Lee, HyeYeon Won, OnSeok Lee (Soonchunhyang Univ., ROK)
16-10	Detection System for Anomalies of Users Using Blockchain and Biometric Authentication
	Hyeok Kang, Keun-Ho Lee (Baekseok Univ., ROK)

Conference Program

Session 17: Interactive Presentation Session IV (Room 3 / Venice)

10:40-12:10, Tue, June 22, 2021

Chair: Dr. Jang Hyun Kim (Sungkyunkwan Univ., ROK)

17-1	A framework for IOC integration and association analysis of cyber threat intelligence
	Gun-Yoon Shin, Dong-Wook Kim, Myung-Mook Han (Gachon Univ., ROK)
17-2	Performance Analysis of DENM and CAM Coexistence based on LTE-V2X Mode 4
	Seoncheol Ha, Jong-Moon Chung (Yonsei Univ., ROK)
17-3	Applying Multi-Device 3C Principle for Designing User Experience in IoT
	Frank Elijorde (West Visayas State Univ., Philippines), Hajeong Yoo, Yumin Jo, Yejin Jang, Jong Ho Paik (Seoul Women's Univ., ROK)
17-4	A Nested Wave-U-Net Architecture for End-to-End Single-Channel Speech Enhancement
	Seon Man Kim, Kwang-Hoon Lee, Hoe-Min Kim, Sungkuk Chun, Unyong Kim, Jeongrok Yun (Korea Photonics Technology Institute, ROK)
17-5	Violent Situation Detection Based on Environmental Sounds to Enforce Social Safety in Surveillance Camera Blind Spots
	Seon Man Kim, Gwang Sun Beak (Korea Photonics Technology Institute, ROK), Bumsuk Jang (BS Soft Co., LTD., ROK)
17-6	A study on 3D Face Reconstruction using deep learning algorithm
	Dexiang Yao, Kalaphath Kounlaxay (Pai Chai Univ., ROK), Jaewoo Chang (Braves Co, ltd., ROK), Shinjin Kang (Hongik Univ., ROK), Soo Kyun Kim (Jeju National Univ., ROK)

Conference Program

| 10:40-12:10, Tue, June 22, 2021 |

Session 17: Interactive Presentation Session IV (Room 3 / Venice)
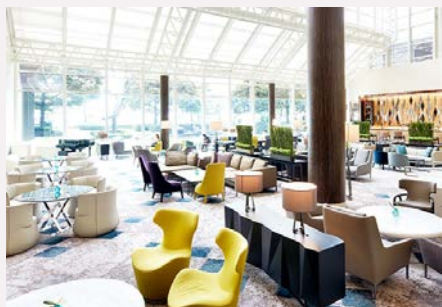
10:40-12:10, Tue, June 22, 2021
              Chair: Dr. Jang Hyun Kim (Sungkyunkwan Univ., ROK)

17-7	Comparative analysis of the generative model with the artist's work in the field of surreal and abstract Hyeongrae Cho, Gooman Park (Seoul National Univ. of Science & Technology, ROK)
17-8	Proposal of Variable Scenario-based XR Education and Training Content to Capability with Emergency Situations Youngik Gil (STans Inc., ROK), Jonghwa Park (Seoul National Univ. of Science & Technology, ROK), Heewon Paek, Jihye Jeon (STans Inc., ROK)
17-9	A Quantitative Data Interpretation Method for Driver Behaviors from OBD-II Data of Electronic Vehicles Jin Won Park, Changwoo Kim, Jeonghoon Kang, Hyo sub Choi (KETI, ROK)
17-10	Investigating user perception via semantic network analysis: A case of mobile health services Seon Hong Lee, Dongyan Nan, Jang Hyun Kim (Sungkyunkwan Univ., ROK)

Venue Information

| **Conference contact** |

Address : 296, Haeundaehaebyeon-ro, Haeundae-gu, Busan, Korea
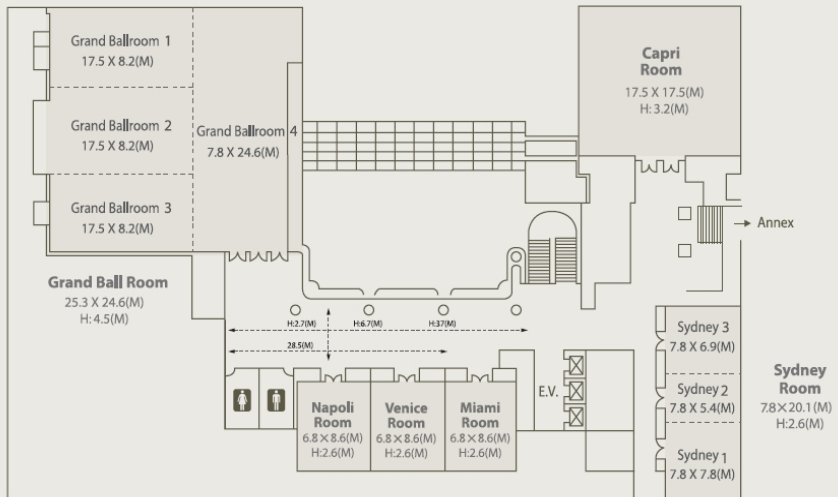
Tel : +82 051-749-2111~3

Venue Information

| **PARADISE Hotel, Busan, Korea**|

https://www.busanparadisehotel.co.kr/

MEETING PLANNER GUIDE

Haeundae Beach

Main Bldg. 2F

Grand Ballroom 1
17.5 X 8.2(M)

Grand Ballroom 2
17.5 X 8.2(M)

Grand Ballroom 3
17.5 X 8.2(M)

Grand Ballroom 4
7.8 X 24.6(M)

Grand Ball Room
25.3 X 24.6(M)
H: 4.5(M)

H:2.7(M)   H:6.7(M)   H:37(M)
28.5(M)

Napoli Room
6.8×8.6(M)
H:2.6(M)

Venice Room
6.8×8.6(M)
H:2.6(M)

Miami Room
6.8×8.6(M)
H:2.6(M)

E.V.

Capri Room
17.5 X 17.5(M)
H: 3.2(M)

→ Annex

Sydney 3
7.8 X 6.9(M)

Sydney 2
7.8 X 5.4(M)

Sydney 1
7.8 X 7.8(M)

Sydney Room
7.8×20.1 (M)
H:2.6(M)

| **Organized by** |

| **Sponsored by** |