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THE 14TH INTERNATIONAL CONFERENCE
ON FUTURE INFORMATION &
COMMUNICATION ENGINEERING

12-14th January, 2022
Ramada Jeju City Hall, Jeju

Proceedings
QR Code



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Welcome Message from General Chair

Dear respected scholars and professionals,

On behalf of the conference committees, it is my great pleasure to welcome all of you to ICFICE2022, the 14th International Conference on Future Information & Communication Engineering that is being held in Jeju Island, on 12th-14th January, 2022.

As new and diverse technologies continue to appear after the COVID-19 pandemic, it is now an era in which everyone should study technology.

As the spread of vaccines and the development of therapeutics become visible, it is time to think about life after the pandemic. Humanity, who has been living in a pandemic for about two years, is no longer the same as before. Our ICT researchers and companies are paying attention to the desires of people who are accustomed to a world that crosses online and offline, virtual and reality, and are preparing more diverse and interesting technologies and services than ever before.

Information and communication researchers should select six industries (metaverse, streaming, ESG, AI, network, finance) where pent-ups are concentrated and predict and prepare for changes in IT technology trends and the future.

As the general chair of ICFICE2022, I am pleased to announce that notable papers have been published here and several have been published in relevant SCOPUS indexed journals, including JICCE, to share their work with researchers around the world. We would like to thank the Program Committee and Organizing Committee members, keynote speakers, judges and authors who contributed to the success of this conference. I hope this conference will be a meaningful and happy time for you.

Dr. Seong-Yoon Shin
General Chair of ICFICE2022

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Gwanghyun Jo (Kunsan National University, Korea)
Wooseok Ryu (Catholic University of Pusan, Korea)

Conference Schedule Overview

● 12th January, 2022

• Registration

- Time : 15:30 ~ 16:30 (12th, January, 2022)
- Place : Meeting Room B(B2), Ramada Jeju City Hotel, Korea

• Opening Ceremony / Keynote Speech

- Time : 16:30 ~ 18:00 (12th, January, 2022)
- Place : Ball Room(B2), Ramada Jeju City Hotel, Korea
- Keynote Speech

Title : Scalable Predictive Analysis using Multiple GPUs leveraging Big Data

Speaker : Prof. Jongwook Woo

(California State University College of Business&Economics, USA)

• Dinner

- Time : 18:00 ~ 20:00 (12th, January, 2022)
- Place : Restaurant(1F), Ramada Jeju City Hotel, Korea

● **13th January, 2022**

• Registration

- Time : 9:40 ~ 12:00 (13th, January, 2022)
- Place : Meeting Room B (B2), Ramada Jeju City Hotel, Korea

• Chair. Meeting

- Time : 10:20 ~ 10:40 / 13:00 ~ 13:20 (13th, January, 2022)
- Place : Ball Room (B2), Ramada Jeju City Hotel, Korea

• Technical Session

- Time : 10:40 ~ 12:00 / 13:20 ~ 15:30 (13th, January, 2022)
- Place : Ball Room / Meeting Room A(B2), Ramada Jeju City Hotel, Korea

• Lunch

- Time : 12:00 ~ 13:00 (13th, January, 2022)
- Place : Restaurant(1F), Ramada Jeju City Hotel, Korea

● **14th January, 2022**

• Business Benchmarking

- Time : 9:30 ~ 13:30 (14th, January, 2022)
- Place : KAKAO Corp.

ICFICE 2022 THE 14TH INTERNATIONAL CONFERENCE ON FUTURE INFORMATION & COMMUNICATION ENGINEERING	
13th January, 2022, Ramada Jeju City Hotel, Korea	
Technical Session : ORAL	Session IS-A Prof. Sungkwan Youm (Wonkwang Univ.)
10:40 ~ 12:00 (BALL ROOM)	IS-1
	IS-2
	IS-3
	IS-4
	IS-5
Technical Session : ORAL	Session CA-A, MD-A Prof. Se-woon Choe (Kumoh National Institute of Tech.)
10:40 ~ 12:00 (MEETING ROOM A)	CA-1
	CA-2
	CA-3
	MD-1
	MD-2
12:00 ~ 13:00	Lunch Break

* IS : Intelligent Information System
 CA : Communication System and Application
 MD : Multimedia and Digital Convergence

ICFICE 2022 THE 14TH INTERNATIONAL CONFERENCE ON FUTURE INFORMATION & COMMUNICATION ENGINEERING	
13th January, 2022, Ramada Jeju City Hotel, Korea	
Technical Session : ORAL	Session IT-A, DA-A Prof. Jongwook Jang (Dong-eui Univ.)
13:20 ~ 14:20 (MEETING ROOM A)	IT-1
	IT-2
	IT-3
	IT-4
	DA-1
Technical Session : ORAL	Session IB-A, NS-A, BI-A, SC Prof. Jongtae Lee (Seoul Women's Univ.)
14:30 ~ 15:30 (MEETING ROOM A)	IB-1
	IB-2
	NS-1
	BI-1
	SC-1

- * IT : IT Convergence Technology
 DA : Database and Internet Application
 IB : IoT and Big Data
 NS : Networking and Services
 BI : Biomedical Imaging and Engineering
 SC : Semiconductor and Communication Services

ICFICE 2022 THE 14TH INTERNATIONAL CONFERENCE ON FUTURE INFORMATION & COMMUNICATION ENGINEERING			
13th January, 2022, Ramada Jeju City Hotel, Korea			
Technical Session : POSTER	Session BI-B, IT-B, IB-B Prof. Semin Kim(Jeonju National University of Education) Prof. Choong Ho Lee (Hanbat National Univ.)		
13:30 ~ 14:00 (BALL ROOM)	BI-2	IT-10	IT-17
	BI-3	IT-11	IT-18
	IT-5	IT-12	IT-19
	IT-6	IT-13	IB-3
	IT-7	IT-14	IB-4
	IT-8	IT-15	IB-5
	IT-9	IT-16	
14:00 ~ 14:20	Coffee Break		
Technical Session : POSTER	Session IS-B, NS-B, CA-B, MD-B, DA-B Prof. Sung-Hwa Han(Tongmyong Univ.) Prof. Kwang-Seong Shin(Wonkwang Univ.)		
14:20 ~ 14:50 (BALL ROOM)	IS-6	IS-13	MD-6
	IS-7	NS-2	MD-7
	IS-8	NS-3	MD-8
	IS-9	CA-4	MD-9
	IS-10	MD-3	DA-2
	IS-11	MD-4	DA-3
	IS-12	MD-5	

* BI :Biomedical Imaging and Engineering
 IT : IT Convergence Technology
 IB : IoT and Big Data
 IS : Intelligent Information System
 NS : Networking and Services

CA : Communication System and Applications
 MD : Multimedia and Digital Convergence
 DA : Database and Internet Application

ICFICE 2022 THE 14TH INTERNATIONAL CONFERENCE ON FUTURE INFORMATION & COMMUNICATION ENGINEERING			
13th January, 2022, Ramada Jeju City Hotel, Korea			
Technical Session : POSTER	Session IS-C, IT-C, CA-C, NS-C, IB-C Dr. Daehwan Kim(ETRI) Prof. Jin-Ho Chung(University of Ulsan)		
15:00 ~ 15:30 (BALL ROOM)	IS-14	IT-21	NS-5
	IS-15	IT-22	IB-6
	IS-16	CA-5	
	IT-20	NS-4	

* IS : Intelligent Information System

IT : IT Convergence Technology

CA : Communication System and Applications

NS : Networking and Services

IB : IoT and Big Data

13th January, 2022

Session IS-A : Intelligent Information System

Session Chair : Prof. Sungkwan Youm
(Wonkwang Univ.)

10:40~12:00

- IS-1 : Analysis of Pet Activity Using Sensor Data with a Machine Learning Algorithm**
Ali Hussain, Sikandar Ali, Abdullah, Athar Ali, M.Mohsin, and Hee-Cheol Kim
(Inje University)
- IS-2 : Classification of Algae Plant Using Deep Learning**
Abdullah, Ali Sikandar, Ali Hussain, Ali Athar, M.Mohsin, and Hee-Cheol Kim
(Inje University)
- IS-3 : Design of Optimal Dwelling Time Scheduling for Package Tour by Machine Learning-based Prediction Model**
Aria Bisma Wahyutama, Byung Wook Kim, and Mintae Hwang
(Changwon National University)
- IS-4 : A Performance Evaluation of the Alpha-Beta filter Algorithm with different Learning Modules ANN, DELM, CART and SVM**
Junaid Khan and Kyungsup Kim (Chungnam National University)
- IS-5 : Multi-Criteria Decision-Making (MCDM) theory Based Ranking of Retirement Homes with its Facilitated Services**
Prommy Sultana Hossain, Junaid Khan, and Kyungsup Kim
(Chungnam National University)

Session CA-A : Communication System and Applications

Session MD-A : Multimedia and Digital Convergence

Session Chair : Prof. Se-woon Choe
(Kumoh National Institute of Tech.)

10:40~12:00

- CA-1 : Developing Waqf Land Information System for the Government of Cianjur District**
Tarmin Abdulghani¹, Cucu Solihah¹, and Rita Rijayanti²
(¹Suryakencana University, ²Changwon National University)

CA-2 : Designing of Mobile Interface for Thesis Management System by Enterprise Portal

Asep Somantri¹ and Rita Rijayanti²
(¹Pasundan University, ²Changwon National University)

CA-3 : Design of Self-Evaluation Model for Smart City in Bandung

Aisyah Nuraeni, Yiyi Supendi, and Daniel Rohmatulloh
(Langlangbuana University)

MD-1 : A New Segmentation and Extraction Method for Manchu Character Units

Aaron Daniel Snowberger and Choong Ho Lee (Hanbat National University)

MD-2 : Binary Gender Perspective on IVML Prototype Using Kansei Engineering Approach

Nur Faraha Bte Hj. Mohd. Naim (University Malaysia Sabah)

Session IT-A : IT Convergence Technology

Session DA-A : Database and Internet Application

Session Chair : Prof. Jongwook Jang
(Dong-eui Univ.)

13:20~14:20

IT-1 : Analysis of Robust Anomaly Detection Using Convolutional Neural Network with Industrial Load Power Data

Rita Rijayanti, Kyohong Jin, and Mintae Hwang
(Changwon National University)

IT-2 : Deep Learning Based Object Identification Integrated in a ROS system

Cubahiro Roland, Donggyu Choi, and Jongwook Jang (Dong-eui University)

IT-3 : Trends in Mobile Ransomware and Incident Response from the Perspective of Digital Forensics

Min-Hyuck Ko, Pyo-Gil Hong, and Dohyun Kim (Catholic University of Pusan)

IT-4 : Sleep Analysis from Polysomnography Signals Using Consumer Device and Machine Learning Approach

Md Ariul Islam Mozumder, Muhammad Mohsan Sheeraz, Ali Athar, and Hee-Cheol Kim (Inje University)

DA-1 : Diffusion Factors of Business Intelligence Systems in Corporates

Yaeri Kim and Jongtae Lee (Seoul Women's University)

Session IB-A : IoT and Big Data

Session NS-A : Networking and Services

Session BI-A : Biomedical Imaging and Engineering

Session SC : Semiconductor and Communication Service

Session Chair : Prof. Jongtae Lee
(Seoul Women's Univ.)

14:30~15:30

- IB-1 : Investigating Handgrip Strength for the Detect of Cognitive Impairment**
Hyungsin Kim¹ and Yuyi Park²
(¹Kookmin University, ²Seoul National University)
- IB-2 : Real-Time Recovery and Object Detection of Compressed Sensed Data**
Hye-min Kwon¹, Hyun Ahn¹, Yonggeol Lee¹, NakMyoung Sung², Mingoo Kang¹, and Jeongwook Seo¹ (¹Hanshin University, ²KETI)
- NS-1 : Analysis of 5G AKA vulnerabilities through 5G simulator**
SeoWoo Jung, Seunghwan Yun, and Okyeon Yi (Kookmin University)
- BI-1 : Design of an Orthogonality Sampling Method in Microwave Imaging for a Fast Identification of a Small Anomaly**
Seongje Chae¹, Young-Deuk Joh², and Won-Kwang Park¹
(¹Kookmin University, ²Gyeongin National University of Education)
- SC-1 : Macro-modeling of P-type Feedback Field-Effect transistor**
Jong Hyeok Oh¹, Faraz Najam², and Yun Seop Yu¹
(¹Hankyong National University, ²National Disability Insurance Agency)

Session BI-B : Biomedical Imaging and Engineering

Session IT-B : IT Convergence Technology

Session IB-B : IoT and Big Data

Session Chair :
Prof. Semin Kim (Jeonju National University of Education)
Prof. Choong Ho Lee (Hanbat National Univ.)

13:30~14:00

- BI-2 : Predicting Localization of Pneumothorax - Collapsed Lungs using Deep Learning**
Akbarali Otakhanov, Athar Ali, and Hee-Cheol Kim (Inje University)

- BI-3 : A Preliminary Study of the Proliferation Control System for Cervical Cancer Cells**
 Jiheon Lim, Juhui Choi, Joo-eun Lee, and Se-woon Choe
 (Kumoh National Institute of Technology)
- IT-5 : Real-Time AI Model Learning Method for the Digital Twin-Based Smart Pipe Integrated Management system**
 Phil-Doo Hong¹, Jongseo Lee², and YuDoo Kim¹
 (¹Korea Polytechnic, ²Movements Co., Ltd.)
- IT-6 : Method Of Design Drawing Conversion Automation for 3D BIM**
 Jongseo Lee and Il-Young Moon (KOREATECH)
- IT-7 : A Research on Automatic Generation of Video Metadata for Media Super-Personalization Recommendation**
 Sung-Jung Yong, Hyo-Gyeong Park, Yeon-Hwi You, and Il-Young Moon
 (KOREATECH)
- IT-8 : Gaussian filter design for occupant heat detection and movement management**
 Hyung O Kim¹, Eungsuk Kim², and Hyo-Jai Lee¹
 (¹Korea Polytechnic I, ²Soludus)
- IT-9 : Block-chain-based medical information security for collaboration in a telemedicine environment**
 Young-Bok Cho (Daejeon University)
- IT-10 : A Study on the Importance of Post-Processing for Each Use Situation of Deep Learning**
 Donggyu Choi, Minyoung Kim, and Jongwook Jang (Dong-eui University)
- IT-11 : A Decentralized Approach of Healthcare Data Collection for Research**
 Muhammad Mohsan Sheeraz, Md Ariful Islam, Abdullah, and Hee-Cheol Kim
 (Inje University)
- IT-12 : Correlation Analysis of Production Changes of Feed Crop Data according to Climate Change**
 Moon-Sun Shin¹, Seong-Won Lee², Sang-Ho Moon¹, and Seon-Min Hwang¹
 (¹Konkuk University, ²Chungbuk National University)
- IT-13 : Implementation of an AI-based Vision Inspection System for Semiconductor Process Quality Control**
 Byung-Chul Kim¹, Moon-Sun Shin², and Seon-Min Hwang³
 (¹Baekseok University, ²Konkuk University, BizForce Co., Ltd.)
- IT-14 : Design of Intelligent Monitoring System for Smart Farm Applying Machine Learning**

Kyeong-Ja Jeong¹, Ae-Ran Jeong², Moon-Sun Shin³, Seon-Min Hwang³, and
Byung-Chul Kim⁴

(¹Chungcheong University, ²Chungbuk National University,

³Konkuk University, ⁴Baekseok University)

IT-15 : Real-time File Access Monitoring Technology in Zero-Trust Architecture

Sung-Hwa Han¹ and Daesung Lee²

(¹Tongmyong University, ²Catholic University of Pusan)

IT-16 : A Study on the Impact of the Covid19 Pandemic on Individuals' ICT Utilization

Moon-Koo Kim and Jong-Hyun Park (ETRI)

IT-17 : Novel Engineering and Phenomenological Qualitative Research

Ki-Cheon Hong (Jeonju National University of Education)

IT-18 : Deep Learning-based PM10 Prediction Model using EEMD

Yong-Jin Jung and Chang-Heon Oh (KOREATECH)

IT-19 : Extracting the optimal moving patterns of edge devices by applying frequency and weights

Yon-Sik Lee and Min-Seok Jang (Kunsan National University)

IB-3 : A Study on Big Data Refining Technique for Analysis and Visualization of Public Services Based on R Programming

Dong-Eon Yoon, Hyo-Sang Lee, Jun-Hyoung Kim, and Am-Suk Oh

(Tongmyong University)

IB-4 : Blockchain-based Anonymous Authentication for IIoT Applications

YoungJoo Lee¹ and Sung-Hee Woo²

(¹Chungbuk National University, ²Korea National University of Transportation)

IB-5 : Development of Black Ice Area Detection in Degradation Road Images Using Deep Learning

Jae-Yong Hwang, Min-Hye Lee, and Sun-Kyoung Kang

(Wonkwang University)

Session IS-B : Intelligent Information System

Session NS-B : Networking and Services

Session CA-B : Communication System and Applications

Session MD-B : Multimedia and Digital Convergence

Session DA-B : Database and Internet Application

Session Chair :

Prof. Sung-Hwa Han(Tongmyong Univ.)

Prof. Kwang-Seong Shin(Wonkwang Univ.)

14:20~14:50

- IS-6 : Design of Minimal Codes for Distributed Systems**
Dongsik Jo and Jin-Ho Chung (University of Ulsan)
- IS-7 : Establishment of Smart Factory Advancement of Automobile Parts Manufacturing Companies**
Hyoung-Hwan Kim¹, Jung-Yee Kim², and Doo-Jin Park²
(¹SUNSOFT, ²Tongmyong University)
- IS-8 : Intelligent Transportation System based on an Edge AI**
Young Woo Jeong, Hyun Woo Oh, Su Yeon Jang, and Seung Eun Lee
(Seoul National University of Science and Technology)
- IS-9 : Fuel cell-based electric powered ship power operation algorithm design**
Jong-Hak Lee, Ji-Hyun Oh, and Jin-Seok Oh
(Korea Maritime and Ocean University)
- IS-10 : A study on the power control system algorithm for HEPS applying ML methods**
Ji-Hyun Oh, Jong-Hak Lee, and Jin-Seok Oh
(Korea Maritime and Ocean University)
- IS-11 : An Experimental Analysis of Factors for Effective Subset Selection During Training Neural Networks**
Hayoung Park, Young Han Lee, Dong Hyung Seong, and Choongsang Cho
(KETI)
- IS-12 : Reducing speaker error rate in multi-speaker speech synthesis with GST**
Dong Hyun Seong, Ha Young Park, Choong Sang Cho, and Young Han Lee
(KETI)
- IS-13 : False Identification of Personal Computer by Altered EFI-SMBIOS**
Hyo-Joong Suh¹ and Hoyoung Hwang²
(¹The Catholic University of Korea, ²Hansung University)
- NS-2 : A Deep Learning Method for Human Activity Classification using Wearable Sensors**
Jong-Hoon Youn¹ and Teuk-Seob Song²
(¹University of Nebraska at Omaha, ²Mokwon University)
- NS-3 : Introduction of Freshness Ratio of Information**
Yutae Lee (Dong-eui University)

- CA-4 : Fake News Detection Using Deep Learning Techniques**
Ali Athar, Akbarali Otakhanov, and Hee-Cheol Kim (Inje University)
- MD-3 : Teleported Virtual Human Framework for Multi-User Remote Collaboration**
Dongsik Jo (University of Ulsan)
- MD-4 : Differential Evolution Algorithm Based on Ecological Model**
Gotovsuren Ichinkhorloo¹, Xujie Tan², Seong-Yoon Shin³,
and Kwang-Seong Shin⁴ (¹Mongolia International University,
²Jiujiang University, ³Kunsan National University, ⁴Wonkwang University)
- MD-5 : Few-Shot Learning-Based Image Classification**
Guangxing Wang¹, Seong-Yoon Shin², and Hyun-Chang Lee³
(¹Jiujiang University, ²Kunsan National University, ³Wonkwang University)
- MD-6 : Analysis of the Recent Research Trends in Image-based 3D Human Shape Estimation**
Daehwan Kim, Yongwan Kim, Jinsung Choi, and Ki-Hong Kim (ETRI)
- MD-7 : Immersive Avatar Creation Techniques for "Another Me" in Metaverse**
Kwang-Seong Shin¹ and Seong-Yoon Shin²
(¹Wonkwang University, ²Kunsan National University)
- MD-8 : Object Detection and Localization on Map using Multi-Camera and Lidar PointCloud**
Pansipansi Leonardo John, Hyung Gyun Kim, Minseok Jang, and Yonsik Lee
(Kunsan National University)
- MD-9 : Resilience Analysis according to Cross-School Class in Mobile Application Programming Class**
Semin Kim¹ and Sunghyuck Hong²
(¹Jeonju National University of Education, ²Baekseok University)
- DA-2 : Aquaponics System Design with Artificial Intelligence Technology**
Hyun-Sup Lee and JinDeog Kim (Dong-eui University)
- DA-3 : A Study on User-recommended Video Analysis Techniques**
Hyun-Sup Lee and JinDeog Kim (Dong-eui University)

Session IS-C : Intelligent Information System

Session IT-C : IT Convergence Technology

Session CA-C : Communication System and Applications

Session NS-C : Networking and Services

Session IB-C : IoT and Big Data

Session Chair :

Dr. Daehwan Kim (ETRI)

Prof. Jin-Ho Chung (University of Ulsan)

15:00~15:30

IS-14 : Computer Vision-based System Design for Classifying Workplace Dangerous Situation

Taejun Lee¹, Hyeonock Song², SungEui Yang¹, and Hoekyung Jung¹
(¹PaiChai University, ²Dasom Information)

IS-15 : Implementation of Multi-LSTM Model for Water Level Prediction

Minwoo Cho¹, Hangil Kim², Jieun Lee¹, and Hoekyung Jung¹
(¹PaiChai University, Korea University of Media Arts)

IS-16 : Efficient Computer Aided Foot Stress Fracture Detection

Joon-Sung Park¹, Doo Heon Song², Young Woon Woo³, and Kwang-Baek Kim¹
(¹Silla University, ²Yong-in Art and Science University, ³Dong-eui University)

IT-20 : Shortest distance algorithm based path detection system in case of flash flood

Sungwoo Jeon, Sungock Lee, Changsu Kim, and Hoekyung Jung
(PaiChai University)

IT-21 : Analysis of User's Emotional Responses in Interactive Immersive Display

Hyun-Rin Park¹ and Noo-ree Kim², and Hyun-Jun Choi²
(¹Gwangju University, ²Mokpo National Maritime University)

IT-22 : Fall detection system applying parameters processed by accelerometer data to long-short term memory

Seung Su Jeong¹, Nam Ho Kim², and Yun Seop Yu¹
(¹Hankyong National University, ²Korea Polytechnic)

CA-5 : Various Positions of Optical Phase Conjugator in Dispersion-managed Optical Link for WDM Transmission

Soon-Nuy Kweon¹ and Seong-Real Lee²
(¹Korea National University of Welfare, ²Mokpo National Maritime University)

NS-4 : Indoor Position Learning Technique for Smartphone Environments based on Fuzzy Logic and Wireless Raw Signals

Seunggyu Byeon (Silla University)

NS-5 : Q-learning based MAC protocol for CR networks

Hyung-Kun Park (KOREATECH)

IB-6 : A study on big data analysis related to 'Digital literacy' using newspaper media in South Korea

Sung-ae Kim (Duksung Women's University)



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