

# The 12th International Conference on Computer Science and its Applications (CSA 2020)

December 14-16, 2020  
Jeju, Korea

**Organized by**

**KIPS CSWRG of Korea  
Chongqing Univ. of Post & Telecom of China**

## Conferences

### **The 15th International Conference on Multimedia and Ubiquitous Engineering (MUE 2021)**

- April 22-24 2021, Seoul, South Korea
- <http://www.mue-conference.org/2021/>

### **The 16th International Conference on Future Information Technology (FutureTech 2021)**

- April 22-24 2021, Seoul, South Korea
- <http://www.futuretech-conference.org/2021/>

## Message from the CSA 2020 General Chair

International Conference on Computer Science and its Applications (CSA 2020) is the 12th event of the series of international scientific conference. This conference takes place Jeju, Korea, December 14 - 16, 2020. CSA 2020 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications. CSA 2020 will provide an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of CSA. In addition, the conference will publish high quality papers which are closely related to the various theories and practical applications in CSA. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject. CSA 2020 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2019 (11th Edition: Macau, China), CSA 2018 (10th Edition: Kuala Lumpur, Malaysia), CSA 2017 (9th Edition: Taichung, Taiwan), CSA 2016 (8th Edition: Bangkok, Thailand, 2016), CSA 2015 (7th Edition: Cebu, December, 2015), CSA 2014 (6th Edition: Guam, December, 2014), CSA 2013 (5th Edition: Danang, December, 2013), CSA 2012 (4th Edition: Jeju, November, 2012), CSA 2011 (3rd Edition: Jeju, December, 2011), CSA 2009 (2nd Edition: Jeju, December, 2009), and CSA 2008 (1st Edition: Australia, October, 2008).

The papers included in the proceedings cover the following topics: Mobile and ubiquitous computing, Dependable, reliable and autonomic computing, Security and trust management, Multimedia systems and services, Networking and communications, Database and data mining, Game and software engineering, Grid and scalable computing, Embedded system and software, Artificial intelligence, Distributed and parallel algorithms, Web and internet computing and IT policy and business management.

Accepted and presented papers highlight new trends and challenges of Computer Science and its Applications. The presenters showed how new research could lead to novel and innovative applications. We hope you will find these results useful and inspiring for your future research. We would like to express our sincere thanks to Steering Chairs: James J. (Jong Hyuk) Park (SeoulTech, Korea), Yi Pan (Georgia State University, USA), Han-Chieh Chao (National Ilan University, Taiwan), Young-Sik Jeong (Dongguk University, Korea), Vincenzo Loia (University of Salerno, Italy).

Our special thanks go to the Program Chairs: Yan Li (Inha University, Korea), S. Vimal (National Engineering College, India), Joon-Min Gil (Catholic University of Daegu, Korea), Alireza Souril (Islamic Azad University, Iran), Neil Y. Yen (The University of Aizu, Japan), and all Program Committee members and all the additional reviewers for their valuable efforts in the review process, which helped us to guarantee the highest quality of the selected papers for the conference.

We cordially thank all the authors for their valuable contributions and the other participants of this conference. The conference would not have been possible without their support. Thanks are also due to the many experts who contributed to making the event a success.

CSA 2020 General Chair

Jungho Kang, Baewha Women's University, Korea  
Kim-Kwang Raymond Choo, The University of Texas at San Antonio, USA  
Piao Changhao, Chongqing University of Post and Telecom, China

## Message from the CSA 2020 Program Chairs

Welcome to the 12th International Conference on Computer Science and its Applications (CSA 2020) which will be held in Jeju, Korea, December 14 - 16, 2020. CSA 2020 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications.

CSA 2020 provides an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of Computer Science. In addition, the conference contains high quality papers which are closely related to the various theories and practical applications in Computer Science. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject. CSA 2020 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2019 (11th Edition: Macau, China), CSA 2018 (10th Edition: Kuala Lumpur, Malaysia), CSA 2017 (9th Edition: Taichung, Taiwan), CSA 2016 (8th Edition: Bangkok, Thailand, 2016), CSA 2015 (7th Edition: Cebu, December, 2015), CSA 2014 (6th Edition: Guam, December, 2014), CSA 2013 (5th Edition: Danang, December, 2013), CSA 2012 (4th Edition: Jeju, November, 2012), CSA 2011 (3rd Edition: Jeju, December, 2011), CSA 2009 (2nd Edition: Jeju, December, 2009), and CSA 2008 (1st Edition: Australia, October, 2008).

CSA 2020 contains high quality research papers submitted by researchers from all over the world. Each submitted paper was peer-reviewed by reviewers who are experts in the subject area of the paper. Based on the review results, the Program Committee accepted papers.

For organizing an International Conference, the support and help of many people is needed. First, we would like to thank all authors for submitting their papers. We also appreciate the support from program committee members and reviewers who carried out the most difficult work of carefully evaluating the submitted papers.

We would like to give my special thanks to Prof. James J. (Jong Hyuk) Park, Prof. Yi Pan, Prof. Han-Chieh Chao, Prof. Young-Sik Jeong, and Prof. Vincenzo Loia the Steering Committee Chairs of CSA for their strong encouragement and guidance to organize the symposium. We would like to thank CSA 2020 General Chairs: Prof. Jung-ho Kang, Prof. Kim-Kwang Raymond Choo and Prof. Piao Changhao. We would like to express special thanks to committee members for their timely unlimited support.

CSA 2020 Program Chairs

Yan Li, Inha University, Korea  
S. Vimal, National Engineering College, India  
Joon-Min Gil, Catholic University of Daegu, Korea  
Alireza Souri, Islamic Azad University, Iran  
Neil Y. Yen, The University of Aizu, Japan

## Organization

### Honorary Chair

Doo-Soon Park, Soonchunhyang University, Korea

### Steering Committee

James J. Park, SeoulTech, Korea (Leading Chair)

Yi Pan, Georgia State University, USA

Han-Chieh Chao, National Ilan University, Taiwan

Young-Sik Jeong, Dongguk University, Korea

Vincenzo Loia, University of Salerno, Italy

### General Chairs

Jungho Kang, Baewha Women's University, Korea

Kim-Kwang Raymond Choo, The University of Texas at San Antonio, USA

Piao Changhao, Chongqing University of Post and Telecom, China

### Program Chairs

Yan Li, Inha University, Korea

S. Vimal, National Engineering College, India

Joon-Min Gil, Catholic University of Daegu, Korea

Alireza Souri, Islamic Azad University, Iran

Neil Y. Yen, The University of Aizu, Japan

### Program Vice-Chairs

Jisu Park, Jeonju University, Korea

Pradip Kumar Sharma, University of Aberdeen, UK

Dohyun Kim, Catholic University of Pusan, Korea

Jin Wang, Changsha University of Science & Technology, China

### International Advisory Committee

Mo-Yuen Chow, North Carolina State University, USA

Byung Seok Shin, Inha University, Korea

Shu-Ching Chen, Florida International University, USA

Mohammad S. Obaidat, Monmouth University, USA

Sherali Zeadally, University of Kentucky, USA

Jordi Mongay Batalla, National Institute of Telecommunications, Poland

Wanlei Zhou, Deakin University, Australia

Sethuraman Panchanathan, Arizona State University, USA

Nam-Mee Moon, Hoseo University, Korea

Yang Xiao, University of Alabama, USA

### Publicity Chairs

Arun Kumar Sangaiah, VIT University, India

Shailendra Rathore, Chung-Ang University, Korea

Kwang-il Hwang, Incheon National University, Korea

Fei Hao, Shaanxi Normal University, China

Ka Lok Man, Xi'an Jiaotong-Liverpool University, China

Min Choi, Chungbuk National University, Korea

Hyuk Joon Kwon, Soonchunhyang University, Korea  
Yunsick Sung, Dongguk University-Seoul, Korea

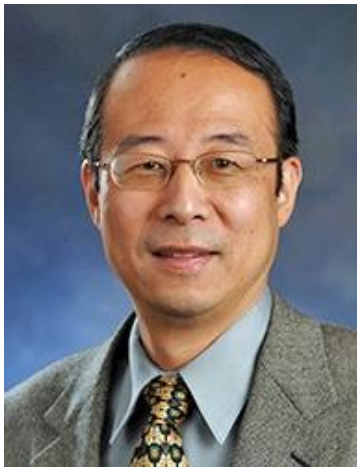
**Local Arrangement Chairs**

Deok Gyu Lee, Seowon University, Korea  
Yeong-Seok Seo, Yeungnam University, Korea  
Jinho Park, Soongsil University, Korea  
Seokhong Min, Mindata co, Korea  
Byoungwook Kim, Dongguk University, Korea  
Hang-Bae Chang, Chung-Ang University, Korea  
Jun-Ho Huh, Korea Maritime and Ocean University, Korea

**Program Committee**

Chia-Hung Yeh, National Sun Yat-sen University, Taiwan  
Debajyoti Mukhopadhyay, Balaji Institute of Telecom & Management, India  
El-Sayed El-Alfy, King Fahd University of Petroleum and Minerals, Saudi Arabia  
Kuei-Ping Shih, Tamkang University, Taiwan  
M. Dominguez Morales, University of Seville, Spain  
Qian Yu, University of Regina, Canada  
Ana Isabel Pereira, Polytechnic Institute of Braganca, Portugal  
Antonina Dattolo, University of Udine, Italy  
Metin Basarir, Sakarya University, Turkey  
Javed Muhammad, Cornell University, Ithaca, NY, USA  
Sungsuk Kim, Sun Moon University, Korea  
Yue-Shan Chang, National Taipei University, Taipei  
Ahmed EL Oualkadi, Abdelmalek Essaadi University, Morocco  
Haiduke Sarafian, The Pennsylvania State University, USA  
Hiroyuki Tomiyama, Nagoya University, Japan  
Jie Shen, University of Michigan, USA  
Jung Hanmin, KISTI, Korea  
Liu Chuan-Ming, National Taipei University of Technology, Taipei  
Qingyuan Bai, Fuzhou University, China  
Sarkar Mahasweta, San Diego State University, USA  
Valev Ventzeslav, Bulgarian Academy of Sciences, Bulgaria  
Valle Mario, Swiss National Supercomputing Centre, Switzerland  
Wojciech Zabierowski, Technical University of Lodz, Poland  
Yu Chang Wu, Chung Hua University, Taiwan  
Yutaka Watanobe, University of Aizu, Japan  
Rui Li, Chongqing University of Post and Telecom, China  
Mingjie Liu, Chongqing University of Post and Telecom, China

## Invited Speaker



### **AI in Bioinformatics and Medicine: Challenges and Opportunities**

**Yi Pan**

Regents' Professor

Department of Computer Science

Georgia State University, Atlanta, Georgia, USA

#### **Abstract:**

Artificial Intelligence (AI) is the science of mimicking human intelligences and behaviors. Machine Learning (ML), a subset of AI, trains a machine how to use algorithms or statistics to find hidden insights and learn automatically from data. Deep learning (DL) is one of machine learning methods where we use deep neural networks with advanced algorithms such as auto-encoding or convolution to recognize patterns in data. AI has become very successful recently due to the availability of huge data and powerful supercomputers. Many applications such as speech and face recognition, image classification, natural language processing, bioinformatics, health informatics such as disease prediction and detection suddenly took great leaps due to the advance of AI. Although various AI architectures and novel algorithms have been invented for many bio and health applications, better explainability, increasing prediction accuracy and speeding up the training process are still challenging tasks among others. In this talk, I will outline recent developments in AI research for bioinformatics and health informatics. The topics discussed include proposing more effective architectures, intelligently freezing layers, gradient amplification, effectively handling high dimensional data, designing encoding schemes, mathematical proofs, optimization of hyper-parameters, effective use of prior knowledge, embedding logic and reasoning during training, result explanation and hardware support. These challenges create a huge number of opportunities for people in both computer science and health care. In this talk, some of our solutions and preliminary results in these areas will be presented and future research directions will also be identified.

#### **Biography:**

Artificial Intelligence (AI) is the science of mimicking human intelligences and behaviors. Machine Learning (ML), a subset of AI, trains a machine how to use algorithms or statistics to find hidden insights and learn automatically from data. Deep learning (DL) is one of machine learning methods where we use deep neural networks with advanced algorithms such as auto-encoding or convolution to recognize patterns in data. AI has become very successful recently due to the availability of huge data and powerful supercomputers. Many applications such as speech and face recognition, image classification, natural language processing, bioinformatics, health informatics such as disease prediction and detection suddenly took great leaps due to the advance of AI. Although various AI architectures and novel algorithms have been invented for many bio and health applications, better

explainability, increasing prediction accuracy and speeding up the training process are still challenging tasks among others. In this talk, I will outline recent developments in AI research for bioinformatics and health informatics. The topics discussed include proposing more effective architectures, intelligently freezing layers, gradient amplification, effectively handling high dimensional data, designing encoding schemes, mathematical proofs, optimization of hyper-parameters, effective use of prior knowledge, embedding logic and reasoning during training, result explanation and hardware support. These challenges create a huge number of opportunities for people in both computer science and health care. In this talk, some of our solutions and preliminary results in these areas will be presented and future research directions will also be identified.



# PROGRAM SCHEDULE FOR CSA 2020

Day 1, December 14, 2020			
Time	Min	HALL A	HALL B
08:40-09:00	20	<b>Registration</b>	
09:00-10:30	90	<b>Session A-1(Online)</b> Chair: Jisu Park	<b>Session B-1(Online)</b> Chair: Jin Gon Shon
10:30-10:40	10	<b>Coffee Break</b>	
10:40-12:10	90	<b>Session A-2(Online)</b> Chair: Dohyun Kim	<b>Session B-2</b> Internet of Things and Sensors Chair: Byungwook Kim
12:10-13:40	90	<b>Lunch</b>	
13:40-14:20	40	<b>Online Keynote Speech: Yi Pan</b> “AI in Bioinformatics and Medicine: Challenges and Opportunities”	
14:20-14:30	10	<b>Coffee Break</b>	
14:30-16:00	90	<b>Session A-3</b> Presentation of young researchers Chair: Pradip Kumar Sharma	<b>Chongqing University</b> <b>Online Session B-3</b> Chair: Mingjie Liu
16:00-16:10	10	<b>Coffee Break</b>	
16:10-17:40	90	<b>Session A-4</b> Data and Multimedia Chair: Koojoo Kwon	<b>Chongqing University</b> <b>Online Session B-4</b> Chair: Rui Li
17:40-18:00	20	<b>Break</b>	

<b>Day 2, December 15, 2020</b>		
<b>Time</b>	<b>Min</b>	<b>HALL A</b>
<b>08:40-09:00</b>	20	<b>Registration</b>
<b>09:00-10:30</b>	90	<b>Session A-5</b> Artificial intelligence and Multimedia Chair: Yuchae Jung
<b>10:30-10:40</b>	10	<b>Coffee Break</b>
<b>10:40-12:10</b>	90	<b>Session A-6(Online)</b> Chair: Byeong-Seok Shin

<b>Day 3, December 16, 2020</b>		
<b>Time</b>	<b>Min</b>	<b>HALL A</b>
<b>09:30-11:00</b>	90	<b>Organizing Committee Meeting</b>
<b>11:00-12:30</b>	90	<b>Local Arrangement Committee Meeting</b>

- 1. A paper presentation should be made by one of authors of the paper for 15 minutes (10 minutes for the presentation itself and 5 minutes for Q/A).**
- 2. All speakers of each session should meet the session chair at their room 10 minutes before the session begins.**
- 3. Windows 10 laptops running the Adobe Reader and Microsoft Office for paper presentations will be prepared. Please prepare for your presentation.**

**DETAILED SCHEDULE FOR**  
**THE 12TH INTERNATIONAL CONFERENCE ON**  
**COMPUTER SCIENCE AND ITS APPLICATIONS (CSA 2020)**

**Day 1, December 14, 2020 (Monday)**

**08: 40-09: 00 Registration**

**09: 00-10: 30 Session A-1 : Online**  
**(HALL A)**  
**(Chair : Jisu Park)**

- 1. A Study on Cloud Resource Allocation for Efficient Online Video Service Based on Reinforcement Learning**  
*Misun Park, Yeseul Lee, Soobeen Oh, Minkyung Jo, Hyerim Jang, Yongik Yoon, Tai-Won Um*
- 2. Recommendation System Based on Reinforcement Learning with Categorized Conditional Replay Memory for Online Media Content**  
*Hyerim Jang, Minkyung Jo, Misun Park, Soobeen Oh, Yeseul Lee, Yongik Yoon, Tai-Won Um*
- 3. Dynamic offloading method based on the dependencies of space for Edge Computing**  
*Jieun Kang, Svetlana Kim, Jaeho Kim, NakMyoung Sung, Yong Ik Yoon*
- 4. Cow Activity Analysis Using Movement Rate Based on Image Processing**  
*Keunho Park, Sunghwan Jeong*
- 5. A Study on the Processing of Timestamps in Creating Multimedia Files on Mobile devices**  
*Jaehyeok Han, Sangjin Lee*
- 6. The Needs Analysis of Software Safety Education Program for Common Competency Area**  
*Ji-Woon Kang, Sung-Ryoung Do*

**09: 00-10: 30 Session B-1 : Online**  
**(HALL B)**  
**(Chair : Jin Gon Shon)**

- 1. Expert Knowledge Fusion based on a Convolutional Gated Network for Phishing URL Classification**  
*Seok-Jun Bu, Hae-Jung Kim*
- 2. A Brief Analysis on State of the Art Spatial Steganalysis Techniques**  
*Saurabh Agarwal, Ki-Hyun Jung*
- 3. Text Classification with Attention Network under Semantic Tensor Space Model**  
*Gil-jae Lee, Han-joon Kim*

4. **A Probabilistic Regular Expression based DGL for Synthetic Big Data Generation**  
*Kai Cheng, Kesuke Abe*
5. **Selecting the Shooting Height and Angle Method for Detection of Bagan Disease Using a Drone**  
*Keunh Park, Kangin Choi, Shinjae Kim, Hyung-geun Ahn, Sunghwan Jeong*

**10: 30-10: 40 Coffee Break**

**10: 40-12: 10 Session A-2 : Online**  
**(HALL A)**  
**(Chair : Dohyun Kim)**

1. **Design of Virtual Reality contents recommendation service based on Object Recognition with Eye-Tracking in Virtual Reality and CNN-LSTM**  
*Jihoon Lee, Namme Moon*
2. **Distance measurement and notification service between objects using Wi-Fi Fingerprinting and YOLOv4 to prevent the spread of COVID-19 in indoor spaces**  
*Minchan Shin, Namme Moon*
3. **Multi-modal emotional analysis mental care service through AI speaker**  
*Junhee Park, Namme Moon*
4. **Deep Character-Level URL Model Based on Convolutional Autoencoder for Zero-Day Phishing Website Detection**  
*Seok-Jun Bu, Hae-Jung Kim*
5. **Classification of glioma subtype from pathological images using deep transfer learning**  
*Eun Young Rha, Sang Hyuk Im, Jonghwan Hyeon, Ho-Jin Choi, Seungjong Kim, Gilly Yun, Yuchae Jung, Tae-Jung Kim*
6. **A Security Model for Common Data Architecture**  
*Jae Dong Lee, Phil Lip Park, DongHun Kyeng, Hyo Soung Cha*

**10: 40-12: 10 Session B-2 : Internet of Things and Sensors**  
**(HALL B)**  
**(Chair : Byungwook Kim)**

1. **Real-time Automatic Passenger Counting using Head Detection in Embedded System**  
*Hyunduk Kim, Sang-Heon Lee, Myoung-Kyu Sohn*
2. **An Efficient Communication-Overhead-Reduction Algorithm Using Template-based Adaptive Signal Compression in Lightweight Embedded IoT Devices**  
*Daejin Park, SeungMin Lee*
3. **Abnormal Beat Detection from Unreconstructed Compressed Signals Based on Linear Approximation in ECG Signals Suitable for Embedded IoT Devices**  
*Daejin Park, SeungMin Lee*
4. **Optimized FPGA Accelerator with a Fidelity-Controllable Sliding-Region for Energy-Efficient Matrix Calculation**

*Dongkyu Lee, Daejin Park*

5. **Prediction of Gas Leak Risk using Log Transform Based K-means Clustering**  
*Khongorzul Dashdondov, Mi-Hye Kim*
6. **Design and Implementation of Pet Drug and Food Feeder Based on IoT**  
*Jisun Shin, Suhuyun Kim, Yerim Moon, Koojoo Kwon*

**12: 10-13: 40 Lunch**

**13: 40-14: 20 Keynote Speech**

**Keynote Speech: Yi Pan**  
**“AI in Bioinformatics and Medicine:  
Challenges and Opportunities”**

**14: 20-14: 30 Coffee Break**

**14: 30-16: 00 Session A-3 : Presentation of young researchers**  
**(HALL A)**  
**(Chair : Pradip Kumar Sharma)**

1. **A Defense Technique of Web Session Hijacking Attacks using Authentication of User Information**  
*Woo Seob Hwang, Ji Su Park, Jin Gon Shon*
2. **An Edge Detection Technique for Improving the Performance of eGAN Model**  
*Cho Youn Lee, jisu park, Jin Gon Shon*
3. **Blockchain-based IoT cloud Architecture for Security Policy Management**  
*Tae Woo Kim, Jong Hyuk Park*
4. **Maximal Balanced Clique Detection in Signed Networks Based on a Modified Three-way Concept Lattice**  
*Yixuan Yang, Doo-Soon Park, Fei Hao, Sony Peng, Min-Pyo Hong*
5. **Movie Recommendation System based on Belief Propagation Technique with a doParallel Algorithm**  
*Sony Peng, Doo-Soon Park, Yixuan Yang, Han-Na Lee, Hyejung Lee*
6. **Discussion & Mentoring**

**14: 30-16: 00 Session B-3 : Online**  
**(HALL B)**  
**(Chair : Mingjie Liu)**

1. **Hot spot detection of thermal infrared image of photovoltaic power station based on multi-task fusion**  
*Piao Changhao, Li Gong, Wang Xianhao, Liu Mingjie*
2. **Gauss Pseudo-spectrum Optimization-based Velocity Planning of Rail Transit Trains with Running and Computation Delays**  
*Zhou Lei, Liu Ping*

3. **Improved Gauss pseudospectral method for UAV trajectory planning with terminal position constraints**  
*Hu Qingquan, Liu Ping*
4. **Study of Hollow Letter CAPTCHAs Recognition Technology Based on Color Filling Algorithm**  
*Shao Huishuang, Meng Kai, Piao Changhao*
5. **Multi-sensor information ensemble-based automatic parking system for vehicle parallel/nonparallel initial state**  
*Changhao Piao, Jun Zhang, Mingjie Liu*

**16: 00-16: 10 Coffee Break**

**16: 10-17: 40 Session A-4 : Data and Multimedia**  
**(HALL A)**  
**(Chair : Koojoo Kwon)**

1. **Prediction of Methane Emissions from Incubated Streambed Sediments Using Normalization**  
*Khongorzul Dashdondov, Mi-Hye Kim*
2. **Ensemble learning with breed classification model for improving the performance of dog face identification model**  
*Bohan Yoon, Hyeonji So, Piao Wenbin, Jongtae Rhee*
3. **Terrain Rendering using Hierarchical Bias Map**  
*Sukyung Sung, Eun-Seok Lee, Byeong-Seok Shin*
4. **Visual-Textual Representation Switching Method for Video Captioning**  
*Heechan Kim, Soowon Lee*
5. **Music Recommendation using Music Auto Tagging**  
*TaeJin Kim, Soowon Lee*
6. **A Study on the Image Resolution Enhancement Method for Far Face Recognition in Smart Glasses**  
*Yong-Kyun Kim, Geon Woo Kim*

**16: 10-17: 40 Session B-4 : Online**  
**(HALL B)**  
**(Chair : Rui Li)**

1. **High-Efficiency Doherty Power Amplifier Based on an Asymmetric Structure**  
*Maolin Liu, Bin Wang, Jiang Teng*
2. **Optimized Multilayer Structure for Enhanced and Broadband Electromagnetic Wave Absorption Properties**  
*Yang Ping-an, Huang Yuxuan, Yang Sun, Li Yuanyuan, Li Rui, Wang Xiaojie*
3. **Design a magnetically controlled soft gripper with versatile grasping based on magneto-active elastomer**  
*Mengjie Shou, Shenyao Fen, Hao Wang, Ping-an Yang, Yuanyuan Li, Yuxuan Huang, Rui Li*
4. **Design of MCU automatic test system for pure electric vehicle air conditioner based on virtual instrument**

*Xu Yang, Chen Shang*

**5. Classification of Temporary and Permanent Line-to-Ground Faults Using Wavelet Transform and Support Vector Machine**

*Zuohong Yang, Pan Duan, Changhao Piao, Ben Zhang, Ya He*

**17: 40-18: 00 Break**

**Day 2, December 15, 2020 (Tuesday)**

**08: 40-09: 00 Registration**

**09: 00-10: 30 Session A-5 : Artificial intelligence and Multimedia**

**(HALL A)**

**(Chair : Yuchae Jung)**

**1. Deep Learning-based Object Tracking in Mobile Robot**

*Myeongsuk Pak, Sanghoon Kim*

**2. Real-Time Gesture Detection and Recognition Using Key Frames Extraction**

*Zongjing Cao, Yan Li, ByeongSeok Shin*

**3. Two Stage Malware Detection Method using Hybrid Analysis Feature**

*Seungyeon Baek, Byeonghui Jeong, Jueun Jeon, Kyuwon Park, Young-Sik Jeong*

**4. Parallel Weighed Graph Clustering based on Minhash**

*Byoungwook Kim, Joon-Min Gil*

**5. An Improved DBSCAN Method Considering Non-Spatial Similarity by Using MinHash**

*Jinuk Yoon, Byoungwook Kim*

**6. Genetic-based keyword matching DBSCAN algorithm**

*Byoungwook Kim*

**10: 30-10: 40 Coffee Break**

**10: 40-12: 10 Session A-6 : Online**

**(HALL A)**

**(Chair : Byeong-Seok Shin)**

**1. Distributed Quantum-Cloud Approach based on Blockchain for Future Smart City**

*Abir EL Azzaoui, Vincenzo Loia, Jong Hyuk Park*

**2. FogKeyAuth: Secure Key Agreement scheme for IoT D2D Networks**

*Mikail Mohammed Salim, Yi Pan, Jong Hyuk Park*

**3. A Blockchain-based Secure Framework using BitTorrent and Telehash Protocols for Smart Manufacturing**

*Sushil Kumar Singh, Jong Hyuk Park*

**4. Understanding Temporal Relations for Clinical Trials Based on End-to-End Learning Approach**

*Chae-Gyun Lim, Yuchae Jung, Ho-Jin Choi*

**5. A Deep Bidirectional Similarity Learning for multivariate time series clustering**

*Jinah Kim, Namme Moon*

**6. Spam image identification using multitype feature scanning**

*Seong-Guk Nam, Dong-Gun Lee, Yeong-Seok Seo*

**Day 3, December 16, 2020 (Wednesday)**

**09:30-11:00**    **Organizing Committee Meeting**

**11:00-12:30**    **Local Arrangement Committee Meeting**

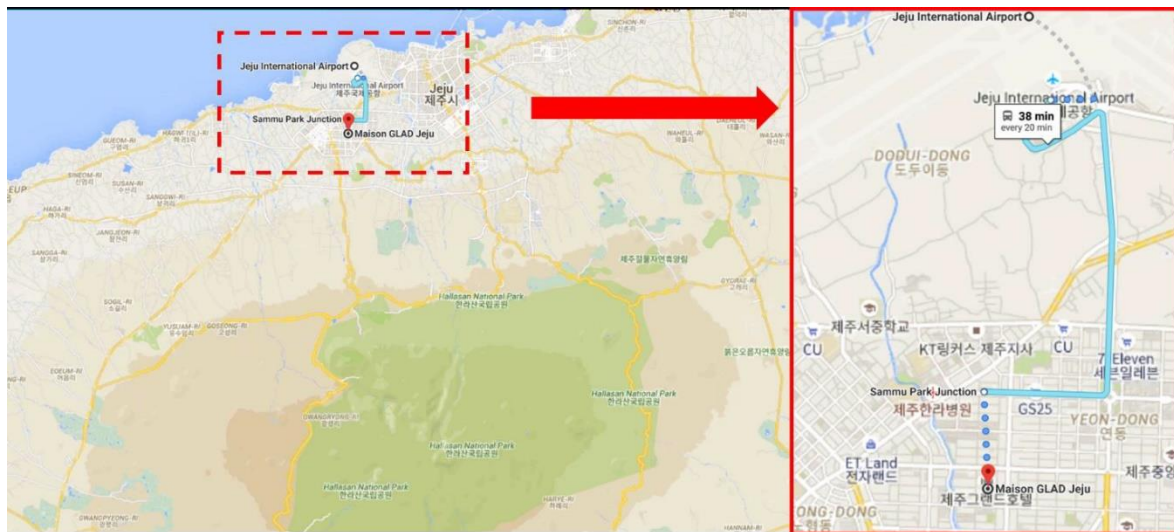


## Conference Venue



### MAISON GLAD JEJU

- MAISONGLAD JEJU Hotel
- 80, Noyeon-ro, Jeju-si, Jeju-do, Korea
- Hotel TEL +82-64-747-5000 / FAX +82-64-742-3150
- Web : <https://maisongladjeju-hotels.com/en/web/maison-en>





## ChongQing, China(Online)

- Chongqing University of Posts & Telecommunications
- 2, Chongwen Road, Nan-an, Chongqing, China

