

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

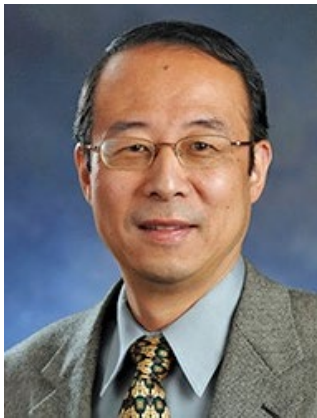
Local Arrangement Chairs

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



Recent Developments in Deep Learning Research

Yi Pan, Ph.D.

CRegents' Professor and Chair

Department of Computer Science

Georgia State University, Atlanta, Georgia, USA

Biography:

Dr. Yi Pan is currently a Regents' Professor and has served as Chair of Computer Science Department at Georgia State University since January 2006. He has also served as an Interim Associate Dean and Chair of Biology Department during 2013-2017. Dr. Pan joined Georgia State University in 2000, was promoted to full professor in 2004, named a Distinguished University Professor in 2013 and designated a Regents' Professor (the highest recognition given to a faculty member by the University System of Georgia) in 2015.

Dr. Pan received his B.Eng. and M.Eng. degrees in computer engineering from Tsinghua University, China, in 1982 and 1984, respectively, and his Ph.D. degree in computer science from the University of Pittsburgh, USA, in 1991. His profile has been featured as a distinguished alumnus in both Tsinghua Alumni Newsletter and University of Pittsburgh CS Alumni Newsletter. Dr. Pan's current research interests mainly include bioinformatics and health informatics using big data analytics, cloud computing, and machine learning technologies. Dr. Pan has published more than 450 papers including over 250 journal papers with more than 100 papers published in IEEE/ACM Transactions/Journals. In addition, he has edited/authored 43 books. His work has been cited more than 13,500 times based on Google Scholar and his current h-index is 70. Dr. Pan has served as an editor-in-chief or editorial board member for 20 journals including 7 IEEE Transactions. Currently, he is serving as an Associate Editor-in-Chief of IEEE/ACM Transactions on Computational Biology and Bioinformatics. He is the recipient of many awards including one IEEE Transactions Best Paper Award, five IEEE and other international conference or journal Best Paper Awards, 4 IBM Faculty Awards, 2 JSPS Senior Invitation Fellowships, IEEE BIBE Outstanding Achievement Award, IEEE Outstanding Leadership Award, NSF Research Opportunity Award, and AFOSR Summer Faculty Research Fellowship. He has organized numerous international conferences and delivered keynote speeches at over 60 international conferences around the world.

Dr. Pan is a "Great Master Face-to-Face" Series Speaker (2012), an IEEE Distinguished Speaker (2000-2002), a Yamacraw Distinguished Speaker (2002), and a Shell Oil Colloquium Speaker (2002). He is a Fellow of RSPH, IET and JSPS and a member of EUAS. He is listed in Men of Achievement, Who's Who in Midwest, Who's Who in America, Who's Who in American Education, Who's Who in Computational Science and Engineering, and Who's Who of Asian Americans.

PROGRAM SCHEDULE FOR CSA 2020

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

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

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

- 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 Bakanae 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. **The method of indoor Distance measurement between objects using Wi-Fi Fingerprinting and YOLOv4 to prevent the spread of COVID-19**
Minchan Shin, Namme Moon
3. **Multi-modal sentiment analysis from AI speaker for mental care service**
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**
Jaе 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, Suhwyn Kim, Yerim Moon, Koojoo Kwon

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

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

Keynote Speech: Yi Pan
“Recent Developments in Deep Learning Research”

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 Multimodal Deep Learning for HPI Behavior classification

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**

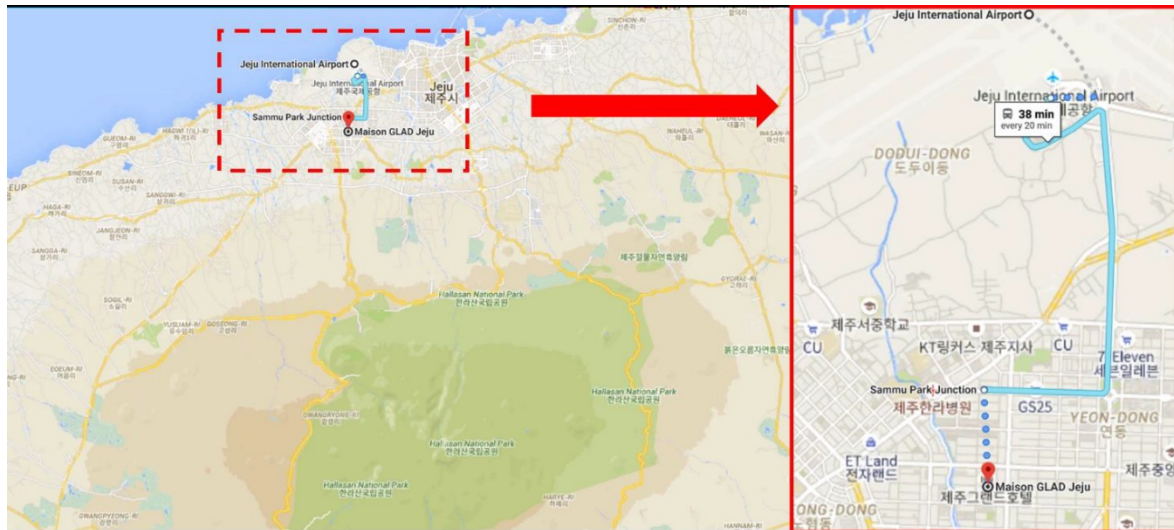
11:00-12:30 **Local Arrangement Committee Meeting**

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

