

The 2020 World Congress on Information Technology Applications and Services

**"Advanced Mobile, Communications, Security,
Multimedia, Vehicular, Cloud, IoT, and Computing"**

February 24-26, 2020
Seoul, Korea

Organized by

World IT Congress & KIPS SWRG



2020 International Conferences
(Sponsored/Technically Sponsored by KIPS/KIPS SWRG)

**The 14th International Conference on Multimedia and Ubiquitous Engineering
(MUE 2020)**

- April 22-24, Seoul, Korea
- <http://www.mue-conference.org/2020>

**The 15th International Conference on Future Information Technology
(FutureTech 2020)**

- April 22-24, Seoul, Korea
- <http://www.futuretech-conference.org/2020>

General Chairs' Message from the World IT Congress 2020

The 2020 World Congress on Information Technology Applications and Services (World IT Congress 2020) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" will be held in Seoul, Korea on February 24~26, 2020. The World IT Congress 2020 is aimed at the address key themes on "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing." World IT Congress 2020 will be the most comprehensive conference focused on information technology, computing, and applications, and will provide an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of Advances in IT, Applications, and Services. In addition, the conference will publish high quality papers which are closely related to the various theories and practical applications in advanced IT. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject.

Accepted and presented papers highlight new trends and challenges of computer science and its applications. The presenters will show 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 Committee: James J. (Jong Hyuk) Park (SeoulTech, Korea), Hamid R. Arabnia(The University of Georgia, USA), Han-Chieh Chao (National Ilan University, Taiwan), Young-Sik Jeong (Dongguk University, Korea), Jianhua Ma (Hosei University, Japan), Qun Jin (Waseda University, Japan). Our special thanks go to the program chairs, 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.

World IT Congress 2020
General Chairs

Yi Pan, Georgia State University, USA
Ka Lok Man, Xi'an Jiaotong-Liverpool University, China
Jungho Kang, Baewha Women's University, Korea

Program Chairs' Message from the World IT Congress 2020

Welcome to the 2020 World Congress on Information Technology Applications and Services (World IT Congress 2020) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing", which will be held in Seoul, Korea on February 24~26, 2020. This congress will be the most comprehensive conference focused on the various aspects of Advances in IT, Applications, and Services (AITA).

This congress 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 this congress and its publications will be a trigger for further related research and technology improvements in this important subject. This congress 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 this congress, 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 James J. (Jong Hyuk) Park (SeoulTech, Korea), Hamid R. Arabnia(The University of Georgia, USA), Han-Chieh Chao (National Ilan University, Taiwan), Young-Sik Jeong (Dongguk University, Korea), Jianhua Ma (Hosei University, Japan), Qun Jin (Waseda University, Japan) as the Steering Committee of World IT for their strong encouragement and guidance to organize the conference. We would like to thank World IT 2020 General Chairs for their advices to make possible organization of The World IT 2020. We would like to express special thanks to execute members for their timely unlimited support.

World IT Congress 2020
Program Chairs

Yunsick Sung, Dongguk University, Korea
Khamphoui Southisombath, National University of Laos, Laos
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Invited Speaker



Current status of ICT Education for National University of Laos

Somphone KANTHAVONG, Ph.D.

Head of Department

Department of Computer Engineering and Information Technology, Faculty of Engineering
National University of Laos, Laos

Abstract

National University of Laos "NUOL" was established by merging the higher education institutes which were under the supervision of several ministries into one university under the Ministry of Education and sports. NUOL has played 4 roles in 1) providing higher education in areas required for the socio-economic development of Laos; 2) performing research in natural and social sciences; 3) preserving the arts, culture and traditions of the nation; and 4) providing academic services to society. It is known for its diversity programs in Bachelor degrees; Master degree programs are conducted in its academic disciplines, and some Doctoral degree programs, as well. In modernization of the university toward digital-based university in the future. NUOL is upgraded for ICT roles to 1) Develop and Manage the ICT infrastructure in the whole university, 2) Develop ICT human resource toward "ICT based society", 3) Supporting and Doing research in the field of Computer Science, Computer Engineering and ICT, and 4) to provide academic services. For strengthening the ICT system in line with the University ICT Development Plan, The ICT Development plan of university is adjusted or improved almost every year in order to catch up with the Rapid pace of the technology. However, it is hard in order to take it into action due to insufficient budget for investment itself. 2011, Since the project called "ASEAN Cyber University" which continuously support by the Republic of Korea, the e-Learning has been being done in NUOL. In addition Lao IT Business Incubation Center (LIBIC) is also one of the core activities and will be identified in this talk.

Professional Experience Record:

- From 1987-1996 : Lecture at Electronic and Electrical College, Ministry of Education and sports
- From 1996-2004 : professor at Department of Electronic and Telecommunication Engineering, Faculty of Engineering, National University of Laos
- From 2004-2008 : Director of Lao-Japan Technical Training Center, Faculty of Engineering, National University of Laos
- From 2008-present : Head of Department of Computer Engineering and Information Technology, Faculty of Engineering, National University of Laos

Research Area:

- QoS Based Routing Algorithm with Crank-Back Ability. International Conference on Control, Automation and System (ICCAS 2003)
- Optical-Quantum Security using Dark-Bright Solution Conversion in a Ring Resonator System, Procedia Engineering
- Evaluation of Medical Ultrasonic Echo Image Quality for No-Reference Image, Regional Conference on Information and Communication Technology
- Intelligent for 3D Localization Supported visitor Tracking Service in Lao's Museum RCCIE-2013,
- Image Quality Criterion of Ultrasonic Echo Image using Standard Deviation, JICTEE 2014
- Smart Tracking System Applied for Lao's Museum using RFID Technology based on Fingerprint Technique
- A Context-Aware Application for Controlling Multi-sensors to Monitor Energy Use in Rooms, The 3rd International Conference on Big Data Applications and services

PROGRAM SCHEDULE FOR WORLD IT CONGRESS 2020

Day 1, Feb. 24, 2020		
Time	Min	HALL -A
10:00-12:00	120	Executive Meeting – Organized by World IT Congress 2020 (Only for Invited Members)
13:00-15:00	120	Local Arrangement Committee Meeting (Only for Invited Members)

Day 2, Feb. 25, 2020		
Time	Min	HALL -A
08:40-09:00	20	Registration
09:00-10:30	90	Session A-1 Chair: Byoungwook Kim
10:30-10:40	10	Coffee break
10:40-12:10	90	Session A-2 Chair: Kwang-il Hwang
12:10-13:00	50	Lunch
13:00-14:30	90	Session A-3 Chair: Joon-Min Gil
14:30-14:40	10	Coffee break
14:40-16:10	90	Session A-4 Chair: Jaehwa Chung
16:10-16:20	10	Coffee Break
16:20-17:50	90	Session A-5 (HCIS Winter Workshop) Chair: Yeong-Seok Seo
17:50-18:00	10	Break
18:00-19:30	90	Banquet

Day 3, Feb. 26, 2020		
Time	Min	HALL -A
09:00-10:30	90	Session A-6 Chair: Hyun-Woo Kim
13:00-15:00	120	Organizing Committee Meeting (Only for Invited Members)

1. A paper presentation should be made by one of authors of the paper for 10-15 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 7 laptops running the Adobe Reader and Microsoft Office for paper presentations will be prepared. Please prepare for your presentation.

**DETAILED SCHEDULE FOR
THE 2020 WORLD CONGRESS ON
INFORMATION TECHNOLOGY, APPLICATIONS
AND SERVICES**

(WORLD IT CONGRESS 2020)

Day 1, Feb. 24, 2020 (Monday)

10:00-12:00 **Executive Meeting - Organized by World IT 2020**

13:00-15:00 **Local Arrangement Committee Meeting**

Day 2, Feb. 25, 2020 (Tuesday)

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

09:00-10:30 **Seesion A-1**
(HALL A)
(Chair: Byoungwook Kim)

- 1. Secure and effective danger state sharing**
Keonhyeong Kim, Im Y. Jung
- 2. Analysis of vulnerabilities that can occur during the extraction phase of OTP mechanism**
Hyunki Kim, Chanil Park, Juhong Han, Chan-guk Jang, Okyeon Yi
- 3. Improving the Security of File System Filter Driver in Windows Embedded OS**
Yeonsang Seong, Chaeho Cho, Yoojae Won
- 4. On-Chip Flash Memory Cloudification for IoT Environment Acceleration Using Server-Side**
Dongkyu Lee, Daejin Park
- 5. Movie Recommendation System using combination of kNN and Betweenness Centrality Methods**
Phonexay Vilakone, Hanna Lee, Doo-Soon Park
- 6. An Efficient Load Balancing Scheme for Gaming Server using Proximal Policy Optimization Algorithm**
Hye-Young Kim

7. An Interoperability Scheme Using Pegged Sidechain in Heterogeneous Blockchain

Hye-Young Kim

10:30-10:40 Coffee Break

10: 40-12:10 Session A-2

(HALL A)

(Chair: Kwang-il Hwang)

1. Colorization for Gray-Scale Medical Images Using Generative Adversarial Network

Dongho Lee, Yan Li, ByeongSeok Shin

2. Combination of community detection based on label propagation and kNN in the recommendation system

Khamphaphone Xinchang, Phonexay Vilakone, Somphone Kanthavong, Hae-Ran Shin, Doo-Soon Park

3. Efficient Massive Data Reception Using GPU-based ECC Decoding Operation Acceleration

Jisu Kwon, Daejin Park

4. Toward Optimizing End-to-End Latency for Vehicle to Infrastructure with Fog Computing

Hojjat Baghban, Ching-Yao Huang, Ching-Hsien Hsu

5. A Collaborative Beam-Switching Algorithm for Wireless Sensors

Semyoung Oh, Daejin Park

6. Cost-effective Safety Assurance Using Process Migration on Mutually Connected Systems

Jeanseong Baik, Kyungtae Kang

7. An Efficient SIEM Architecture using Collaborative Updates

Jeonghun Cha, Jong Hyuk Park

12:10-13:00 Lunch

13:00-14:30 Session A-3

(HALL A)

(Chair: Joon-Min Gil)

1. An Efficient Method of Similarity Measure for Purchase Histories Considering Product Taxonomy

Yu-Jeong Yang, Ki Yong Lee

2. Impact of Word Embedding Methods on Performance of Sentiment Analysis for Movies Reviews

Ho-yeon Park, Kyoung-jae Kim

3. File Tracking Technique with Active Directory Event Log

Jisun Kim, Moses Kwak, Sungwon Lee, Taenam Cho

4. A Graph Embedding Technique with LSTM Autoencoders for Weighted Graphs

Minji Seo, Ki Yong Lee

5. A Comparative Study on FFIEC Accreditation Items for Cloud Computing in Financial Sector

Wonhyo Park, Minsu Jung, Yurim Choi, Hangbae Chang

- 6. Modeling Privacy Risk Analysis Framework for Blockchain based Distributed System**
Jeongwook Kim, Onechul Na, Giwan Hong, Hangbae Chang
- 7. The Kernel Trick for Content-Based Media Retrieval**
Guang-Ho Cha

14:30-14:40 Coffee Break

14:40-16:10 Session A-4
(HALL A)
(Chair: Jaehwa Chung)

- 1. A Study on the Classification Design of New Cybercrime in Cyberspace**
Sehee Pak, Jongwan Kim, Yurim Choi, Hangbae Chang
- 2. Designing Security Framework of Supply Chain with CFI**
Giwan Hong, Onechul Na, Jeongwook Kim, Hangbae Chang
- 3. A Research on Analyzing a Countermeasure System of Technology Leakage in Cyberspace**
Harang Yu, Jongwan Kim, Hangbae Chang
- 4. Design of Detection Methodology for Signs of Technology Outflow based on User Behavior**
Ja Won Kim, Ha Rang Yu, Hang Bae Chang
- 5. Intelligent Consumption Prediction Model and Necessity Factors for Consumption Prediction Using Correlation Analysis**
Kihoon Lee, Namme Moon
- 6. Design of tourist recommendation service using CNN-LSTM and Matrix Factorization**
Jihoon Lee, Minchan Shin, Junhee Park, Dongwook Choi, Jinah Kim, Namme Moon
- 7. Deep Learning-Based Remote Camera Auto-Focus System Design Using Eye Tracking**
Hyeon woo An, Namme Moon

16:10-16:20 Coffee Break

16:20-17:50 Session A-5 HCIS Winter Workshop
(HALL A)
(Chair: Yeong-Seok Seo)

- 1. A Next Task Size Prediction Method during FP-Growth Process**
Jeoung Hoon Lee
- 2. Reputation based Accident Detection Enhancement by Deep Learning for Smart Vehicles**
Keonhyeong Kim, Im Jung
- 3. Implementation Anomaly Behavior Detection Model Based on Behavior Classification**
Cho Jaehyeon, Moon Namme
- 4. ACP Model for CPS in the Vehicle surrounding surveillance**
Svetlana Kim, YongIk Yoon
- 5. Security Enhancement of Biometric Fingerprints Using Human Heart rate Dependent Signal Wavelength Analysis**
Young-Hyun Baek

6. **Project Management Model based on POA Algorithm for Blockchain Platform**
Eunhee Lee, Yongik Yoon, GyuMyoung Lee, TaiWon Um
7. **Content-based Image Retrieval Using Combined Features Extracted from Gabor Correlation and Uniform Magnitude Local Binary Pattern for Texture and Color Autocorrelogram for color**
Hee-Hyung Bu, Nam-Chul Kim
8. **Attention ResCUNet-GAN: A Novel Facial UV Map Completion for Pose-invariant Face Recognition**
Dinh Viet Sang, Tran Quang Chung, Nguyen Duc Dung, In Seop Na
9. **Marine Products Intelligent Auction Solution for Cooperative Fish Market Monitoring System**
Yeong-Seok Seo, Jun-Ho Huh

17:50-18:00 **Break**

18:00-19:30 **Banquet**

Day 3, Feb. 26, 2020 (Wednesday)

09:00-10:30 **Session A-6**
(HALL A)
(Chair: Hyun-Woo Kim)

1. **Efficient Processing of Spatio-Temporal Joins for IoT Data**
Ki Yong Lee, Minji Seo
2. **A Suggestion of Collaborative-Based Development Method through UX/UI Project Risk Factor Analysis in Digital Agencies**
Seong-Hwan Cho, Seung-Hee Kim
3. **A Design of Risk forecast and assessment for the EPC-Industry**
Seung-Hee Kim
4. **Static Analysis for Window Malware using LSTM**
Juen Jeon, Seungyeon Baek, Young-Sik Jeong
5. **Node Virtualization for Structured Overlay Networks Based on Multiple Different Time Intervals**
Tomoya Kawakami
6. **An Adaptive Content Caching Algorithm Based on Reinforcement Learning**
Chung-Yi Chi, Chin-Feng Lai, Wei-Che Chien, Han-Chieh Chao

13:00-15:00 **Organizing Committee Meeting**

Conference Venue



RAMADA SEOUL DONGDAEMUN

- RAMADA SEOUL DONGDAEMUN hotel
 - 354 Donghoro Joong-gu, Seoul (#275-3 Euljiro 5ga, Joong-gu, Seoul), Republic of Korea
 - Front desk TEL +82-2-2276-3500
- Web: <http://www.ramadaddm.com/eng/main/>



How to get to RAMADA SEOUL DONGDAEMUN hotel

-  **From Gimpo Airport**

Limousine Bus

- 6021 (Get off at Acacia Hotel, Western Co-op Residence Station)
- Distance 1hour
- Cost 7,000won

Taxi

- Distance: About 40min
- Cost: About 40,000won

-  **Transportation**

Subway

- Dongdaemun History & Culture Park Station (Line No.2,4,5) Exit No. 7
- Euljiro 4ga (Line No.2,5) Exit No. 7
- Jongro 5ga (Line No.1) Exit No. 6

Bus

- Euljiro 5ga Station (100, 105, 152, 202, 261, 500)
- Bangsan Market Station (100, 104, 407,b 2014)
- Bangsan Jonghab Market (152)

-  **From Incheon Airport**

Limousine Bus

- 6001 (Get off at Baiton Hotel)
- Distance: About 1 hour and 30 minutes
- Cost 15,000won

Taxi

- Distance: About 1 hour
- Cost: About 65,000won