

The 2019 World Congress on Information Technology Applications and Services

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

February 11-13, 2019
Jeju, Korea

Organized by

World IT Congress & KIPS SWRG



2019 International Conferences
(Sponsored/Technically Sponsored by KIPS/KIPS SWRG)

The 13th International Conference on Multimedia and Ubiquitous Engineering (MUE 2019)

- April 24-26, Xian, China
- <http://www.mue-conference.org/2019>

The 14th International Conference on Future Information Technology (FutureTech 2019)

- April 24-26, Xian, China
- <http://www.futuretech-conference.org/2019>

The 2019 International Conference on Big data, IoT, and Cloud computing (BIC 2019) (The name of UCAWSN conferences has been changed.)

- August, 19-21, 2019, Jeju, Korea
- <http://www.bic-conference.org/2019>



General Chairs' Message from the World IT Congress 2019

The 2019 World Congress on Information Technology Applications and Services (World IT Congress 2019) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" will be held in Jeju, Korea on February 11~13, 2019. The World IT Congress 2019 Jeju is aimed at the address key themes on "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing." World IT Congress 2019 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 2019
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 2019

Welcome to the 2019 World Congress on Information Technology Applications and Services (World IT Congress 2019) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing", which will be held in Jeju, Korea on February 11~13, 2019. 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 2019 General Chairs for their advices to make possible organization of The World IT 2019. We would like to express special thanks to execute members for their timely unlimited support.

World IT Congress 2019
Program Chairs

Yunsick Sung, Dongguk University, Korea
Jin Wang, Changsha University of Science and Technology, China
Muhammad Khurram Khan, King Saud University, Kingdom of Saudi Arabia



Organization

Honorary Chair

Doo-soon Park, SoonChunHyang University, Korea

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James J. Park, SeoulTech, Korea (Chair)

Hamid R. Arabnia, The University of Georgia, USA (Co-Chair)

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Young-Sik Jeong, Dongguk University, Korea

Jianhua Ma, Hosei University, Japan

Qun Jin, Waseda University, Japan

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Yi Pan, Georgia State University, USA

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

Jungho Kang, Baewha Women's University, Korea

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Jin Wang, Changsha University of Science and Technology, China

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Seokhong Min, The MINDATA Corporation, Korea

Jinho Park, Soongsil University, Korea

Dohyeun Kim, Jeju National University, Korea

Program Committee

Watanobe Yutaka, University of Aizu, Japan

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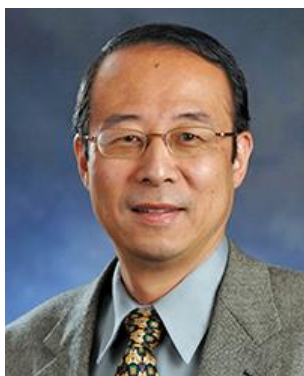
Ahmed EL Oualkadi, Abdelmalek Essaadi University, Morocco

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Tzung-Pei Hong, National University of Kaohsiung, Taiwan
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Ladislav Burita, Brno University of Defence, Czech
Ahmed EL OUALKADI, Abdelmalek Essaadi University



Invited Speaker



Recent Developments in Deep Learning Research

Yi Pan, Ph.D.

Regents' Professor and Chair
Department of Computer Science
Georgia State University, Atlanta, Georgia, USA

Abstract

Neural networks, modeled after the human brain, contain a set of algorithms to recognize patterns via training a data set. Deep learning neural network architectures differ from traditional neural networks because they have more hidden layers and newer training algorithms. Deep learning networks can be trained in an UNSUPERVISED or SUPERVISED manner for both UNSUPERVISED and SUPERVISED learning tasks and hence can be applied in many applications. Deep learning is now producing many remarkable successes in computer vision, automatic speech recognition, natural language processing, audio recognition, bioinformatics and disease prediction and detection. Although various deep learning architectures and novel algorithms have been applied to many big data 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 deep learning research. The topics discussed include proposing more effective architectures, intelligently freezing layers, effectively handling high dimensional data, designing encoding schemes, mathematical proofs, optimization of hyper-parameters, embedding logic and reasoning during training, result explanation and hardware support for deep learning. Some of our solutions and preliminary results in these areas will be presented and future research directions will also be identified in this talk.

Biography

Dr. Yi Pan is currently a Regents' Professor and Chair of Computer Science at Georgia State University, USA. He has served as an Associate Dean and Chair of Biology Department during 2013-2017 and Chair of Computer Science during 2006-2013. 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 research interests include parallel and cloud computing, wireless networks, and bioinformatics. Dr. Pan has published more than 250 journal papers with over 80 papers published in various IEEE journals. In addition, he has published over 150 papers in refereed conferences. He has also co-authored/co-edited 43 books. His work has been cited more than 10,000 times in GoogleScholar and his current H-index is 52. Dr. Pan has served as an editor-in-chief or editorial board member for 20 journals including 7 IEEE Transactions. He is the recipient of many awards including IEEE Transactions Best Paper Award, several other conference and journal best paper awards, 4 IBM Faculty Awards, 2 JSPS Senior Invitation Fellowships, IEEE BIBE Outstanding Achievement Award, NSF Research Opportunity Award, and AFOSR Summer Faculty Research Fellowship. He has organized many international conferences and delivered keynote speeches at over 60 international conferences around the world.

PROGRAM SCHEDULE FOR WORLD IT CONGRESS 2019

Day 1, Feb. 11, 2019		
Time	Min	HALL -A
10:00-12:00	120	Executive Meeting – Organized by World IT 2019 (Only for Invited Members)
13:00-15:00	120	Organizing Committee Meeting (Only for Invited Members)
16:00-17:30	90	Local Arrangement Committee Meeting (Only for Invited Members)

Day 2, Feb. 12, 2019		
Time	Min	HALL -A
12:40-13:00	20	Registration
13:00-14:00	60	Keynote: Recent Developments in Deep Learning Research Yi Pan Regents' Professor and Chair Georgia State University, Atlanta, Georgia, USA Chair: Yunsick Sung
14:00-15:30	90	Session A-1 Chair: Sukhoon Lee
15:30-15:40	10	Coffee Break
15:40-17:10	90	Session A-2 Chair: Byoungwook Kim
17:10-18:00	50	Break
18:00-19:30	90	Banquet

Day 3, Feb. 13, 2019		
Time	Min	HALL -A
08:40-09:00	20	Registration
09:00-10:30	90	Session A-3 Chair: Jaehwa Chung
10:30-10:40	10	Coffee Break
10:40-12:10	90	Session A-4 Chair: Yeong-Seok Seo

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 7 laptops running the Adobe Reader and Microsoft Office for paper presentations will be prepared. Please prepare for your presentation.

**DETAILED SCHEDULE FOR
THE 2019 WORLD CONGRESS ON
INFORMATION TECHNOLOGY, APPLICATIONS
AND SERVICES**

(WORLD IT CONGRESS 2019)

Day 1, Feb. 11, 2019 (Monday)

10:00-12:00 **Executive Meeting - Organized by World IT 2019**

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

16:00-17:30 **Local Arrangement Committee Meeting**

Day 2, Feb. 12, 2019 (Tuesday)

12:40-13:00 **Registration**

13:00-14:00 **Keynote Speech**

(HALL A)

(Chair: Yunsick Sung)

“Recent Developments in Deep Learning Research”

Yi Pan

Regents’ Professor and Chair

Georgia State University, Atlanta, Georgia, USA

14:00-15:30 **Session A-1**

(HALL A)

(Chair: Sukhoon Lee)

- 1. Particulate Matter Prediction Using LSTM and GRU**
Guang Yang, Thanongsak Xayasouk, HwaMin Lee
- 2. DSEM-Traj2018: Building Lifelog Dataset using Smartwatch for Path Prediction**
Sumin Nam, So Jeong Kim, Sukhoon Lee



3. **Movie Recommendation System using k -clique with Normalized Discounted Cumulative Gain**
Phonexay Vilakone, Doo-Soon Park, Khamphaphone Xinchang
4. **A Proposal of a Hybrid Central Controlled Security Platform Based on Blockchain**
Kyung-Taek Song, Seung-Hee Kim
5. **A Firefighting Activity Convergence Information Model for Providing Integrated Fire Safety and Spatial Information**
Hyesun Lee, Sang Gi Hong, Hakjune Lee, Kang Bok Lee
6. **A Construction Method for Structured Overlay Networks Based on Multiple Different Time Intervals**
Tomoya Kawakami
7. **Smart Occupancy Detection System for Efficient Lighting using Deep Learning**
Husnain Asif, Tae-Young Choe

15:30-15:40 **Coffee break**

15:40-17:10 **Session A-2**
(HALL A)
(Chair: Byoungwook Kim)

1. **Design of Haptic Pen for Interaction with Virtual Environment in Mobile Devices**
Sang-Youn Kim, Inho Yun, Dong-Soo Choi, Sangkyu Byeon, Byeong-Seok Shin
2. **Mitigating Catastrophic Forgetting of Neural Network through Pre-prediction of Learning Data**
Dae Yong Hong, Yeon Lee, Byeong-Seok Shin
3. **An Intelligent Intrusion Detection System for Mist Computing-based IoT Environment**
Jung Hyun Ryu, Sang Ki Suk, Jong Hyuk Park
4. **Digital Replica Data Security of Digital Twin**
Jeong Hoon Jo, Yi Pan, Jong Hyuk Park
5. **Min-Max Hash of Clustering based on Mutiset**
Jin Uk Yoon, Byoungwook Kim
6. **Synthesizing Fingerprint from Pattern Type Analysis Features using cGAN**
Samuel Lee, Jae-Gab Choi, Jin-Ho Park, Gye-Young Kim
7. **A Study on EA/Security Policy for Smart Grid Safety**
Man-Ki Kim, Samuel Lee, Jin-Ho Park, Je-Gook Kim
8. **A Study of Quality Evaluation Model for Intelligent Video Surveillance Solution**
Dong-Won Jang, Ji-Su Choi, Nam-Yong Lee, Jin-Ho Park

17:10-18:00 **Break**

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

Day 3, Feb. 13, 2019 (Wednesday)

08:40-09:00 Registration

09:00-10:30 Session A-3
(HALL A)
(Chair: Jaehwa Chung)

- 1. Study on Binary Vulnerability Localization based-on User Input Tracking**
Soojin Yoon, Daeil Jang, Taeun Kim, Hwankuk Kim
- 2. A Study on Binary Vulnerability Patch Techniques caused by Uninitialized Variables**
Geonbae Na, Han Chul Bae, Daeil Jang, Taeun Kim, Hwankuk Kim
- 3. A Study on the Binary Variable Type Inference Based on Assembly Code**
Jongki Kim, Daeil Jang, Taeun Kim, Hwankuk Kim
- 4. Comparing Voice Classifier Methods**
Daeyong Jung, Jaehwa Chung, Daewon Lee
- 5. Comparing Singing Voice Separation Techniques**
Daeyong Jung, Daewon Lee
- 6. Comparing Design Pattern Techniques on Four Motions of Character**
Daeyong Jung, Myungil Kim, Jong-Seon Yim, Daewon Lee
- 7. High Rate DoS Attack Detection System for Cloud Environment with Filtered Store and Analysis Scheme**
Janitza Punto Gutierrez, Kilhung Lee

10:40-10:40 Coffee break

10:40-12:10 Session A-4
(HALL A)
(Chair: Yeong-Seok Seo)

- 1. Improving Software Bug Triage Performance using LDA**
Dong-Gun Lee, Yeong-Seok Seo
- 2. Intelligent Chatbot using Twitter**
Seong-Soo Jeong, Yeong-Seok Seo
- 3. An Approach to Prioritizing Open Source License Compatibility Violations**
Dong-Gun Lee, Yeong-Seok Seo
- 4. Risk Factors Identification and Analysis of Big Data Projects**
Seung-Hee Kim
- 5. A Model of Blockchain e-Commerce in the Payment Gateway-less**
Shee-Ihn Kim, Seung-Hee Kim
- 6. Saliency map based on full connection**
Ho-Seung Kim, Seong-Soo Han, You-Boo Jeon, Chang-Sung Jeong
- 7. UAV Flight Data Generation Method for Deep Learning-based End-to-End Control using Social Media**
Jeonghoon Kwak, Yunsick Sung

Conference Venue

Jeju National University Ara Convention Hall

- Address: 102 Jejudaehak-ro, Jeju-si, Jeju Special Self-Governing Province, 63243, Republic of Korea
- Web: Jeju National University → <http://www.jejunu.ac.kr/eng/>
Ara Convention Hall → <http://jnuic.jejunu.ac.kr/board/view.php?pageID=6>



The international competitiveness of Jeju National University has gained an increasing attention. Earning esteemed appraisals in a range of evaluations conducted by the government and the media, Jeju National University earned international recognition for its values and competence as a representative university in Korea.

Direction (Jeju National University)

- From the Jeju Airport
Bus → No.500(Towards Jeju National University) Travel time: about 35 min.
Taxi → Travel time: about 20 min.
- From City
Bus → (Towards Jeju National University) Travel time: about 20 min.
Taxi → Travel time: about 12 min.



Direction (Ara Convention Hall in Jeju National University)

- Registration Desk location, Session Location and Plenary Talk Location in the campus is in the Jeju National University, Ara Campus Hall (as red mark in the following map).

