The 2021 World Congress on Information Technology Applications and Services

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

February 18-20, 2021
Jeju, Korea

Organized by

World IT Congress & KIPS SWRG

2021 International Conferences
(Sponsored/Technically Sponsored by KIPS/KIPS SWRG)

The 15th International Conference on Multimedia and Ubiquitous Engineering (MUE 2021)
- April 22-24, Jeju, Korea
- http://www.mue-conference.org/2021

The 16th International Conference on Future Information Technology (FutureTech 2021)
- April 22-24, Jeju, Korea
- http://www.futuretech-conference.org/2021

The 5th The International Conference on Big data, IoT, and Cloud Computing (BIC 2021)
- August 16-18, Jeju, Korea

General Chairs' Message from the World IT Congress 2021

The 2021 World Congress on Information Technology Applications and Services (World IT Congress 2021) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" will be held in Jeju, Korea on February 18~20, 2021. The World IT Congress 2021 is aimed at the address key themes on "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing." World IT Congress 2021 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 2021
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 2021

Welcome to the 2021 World Congress on Information Technology Applications and Services (World IT Congress 2021) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing", which will be held in Jeju, Korea on February 18~20, 2021. 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 2021 General Chairs for their advices to make possible organization of The World IT 2021. We would like to express special thanks to execute members for their timely unlimited support.

World IT Congress 2021
Program Chairs

Khamphoui Southisombath, National University of Laos, Laos
Jin Wang, Changsha University of Science and Technology, China
Muhammad Khurram Khan, King Saud University, Kingdom of Saudi Arabia
Dohyun Kim, Catholic University of Pusan, Korea

Organization

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Doo-soon Park, SoonChunHyang University, Korea

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Young-Sik Jeong, Dongguk University, Korea
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Jaehwa Chung, Korea National Open University, Korea
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Tzung-Pei Hong, National University of Kaohsiung, Taiwan

Invited Speaker

Empowering Cognitive Security Systems with Cyber Situation Awareness

Vincenzo Loia (Rector of University of Salerno)
Full professor of Computer Science
Department of Business Science-Management and innovation Systems
University of Salerno-Italy

Abstract

To solve the pressing security challenges of our era related also to threats such as terrorism and cyberterrorism, we need more creative approaches able to detect connections between relations, events and concepts in evolving contexts characterized by structured and unstructured data coming up from multiple sensors and human based networks. In this talk I propose the adoption of Cyber Situation Awareness (SA) to define systems able to handle such issues. Endsley provided a formal definition that considers SA as a three-phase process: perception of the elements of an environment in each time interval, comprehension of these elements and projection of their states into the near future. In detail, from a computational viewpoint, Cyber SA aims at formalizing and deducing situations (occurring in the real world) by processing, fusing and abstracting data and information. The Cyber SA approach needs to be populated with computational intelligence techniques, such as Granular Computing, fuzzy and rough sets, able to gather, pre-process, aggregate and filter data coming from sensors (both physical - coming from sensing devices - and virtual - coming from social networks), to sustain conceptualization and reasoning on situations. In this talk I present some concrete examples of applying the Cyber SA to safety & security and Intelligence Analysis for counterterrorism.

Biography

Vincenzo Loia graduated in Computer Science at the University of Salerno in 1985, and received his PhD in Computer Science in 1989 at the Université Pierre & Marie Curie Paris VI, France. He is currently a Computer Science Full Professor at the University of Salerno, where he served as a researcher from 1989 to 2000, and as associate professor from 2000 to 2004. Since the beginning of his career he has shown a deep and operational research interest, in particular in the use of innovative approaches for complex problems solving through the use of new paradigms of software design and programming, i.e. those of agent and multi-agent systems; in the design and experimentation of systems for approximate reasoning, through the synergistic use of standard semantic technologies, Description Logic and Fuzzy Logic; in the definition of original conceptual data analysis methodologies for knowledge extraction from unstructured sources; in the implementation of decision support systems conveyed by artificial intelligence models, cognitive architectures, computational intelligence and granular computing. With respect to the latter, he demonstrates the capability to understand, apply and contribute to research on models, such as Granular and Cognitive Computing, which strongly base their principles on aspects concerning the study and analysis of human cognitive processes. These research interests have characterised his international outreach through which he has established a rich network of scientific collaborations with researchers worldwide (including a close relationship with the founder of the Fuzzy theory, Lotfi Zadeh). Over the years, the pillars of his scientific research have been applied in various application domains, from medicine to law, and more recently in the cyber-intelligence field. It is exactly in this latter context, that he shows his great aptitude to multidisciplinary, by coordinating the scientific committee of the "Multidisciplinary Observatory for the fight against organised crime and terrorism", which implements ongoing scientific research applied to the Computational Intelligence area and aimed at contrasting terrorist activities spread on the Web and Deep Web, to support

information analysis projects for crimes of the DNA (National Anti-Mafia and Counter-Terrorism Directorate). Moreover, his competences are used to support research related to the 4th industrial revolution, as demonstrated by his scientific responsibility and participation in national projects on smart manufacturing (Leonardo 4.0 - €10M), and international projects on cyber physical systems (CPS4EU - €100M). Lastly, both in the project area and in scientific research, he has shown remarkable team-building skills, bringing together heterogeneous knowledge around original and innovative ideas. All this is witnessed by the large number of co-authorships, on scientific publications, with colleagues from other scientific- disciplinary fields and by the collaborations, established in the framework of research and development projects, with corporate partners and departments in scientific areas, including also those different from Computer Science.

PROGRAM SCHEDULE FOR WOLRD IT CONGRESS 2021

Day 1, Feb. 18, 2021		
Time	**Min**	**HALL -A**
08:40-09:00	20	**Registration**
09:00-10:20	80	**Session A-1 Presentation of young researchers** **Chair: Pradip Kumar Sharma**
10:20-10:30	10	**Coffee break**
10:30-12:00	90	**Session A-2** **Chair: Byoungwook Kim**
12:00-13:20	80	**Lunch**
13:20-14:00	40	**Keynote Speech: Vincenzo Loia (Rector of University of Salerno)** **"Empowering Cognitive Security Systems with Cyber Situation Awareness"** **Chair: Yan Li**
14:00-14:10	10	**Coffee break**
14:10-15:00	50	**Session A-3 (HCIS Winter Workshop)** **Chair: Joon-Min Gil**
15:00-15:10	10	**Coffee break**
15:10-16:30	80	**Session A-4** **Chair: Koojoo Kwon**
16:30-16:40	10	**Coffee break**
16:40-18:00	80	**Session A-5** **Chair: Yan Li**

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Computer Software Research Group

Day 2, Feb. 19, 2021		
Time	Min	HALL –A
10:00-12:00	120	Organizing Committee Meeting I (Only for Invited Members)
12:00-13:00	60	Lunch
13:00-15:00	120	Local Arrangement Committee Meeting (Only for Invited Members)

Day 3, Feb. 20, 2021		
Time	Min	HALL -A
10:00-12:00	120	Executive Meeting – Organized by World IT Congress 2021 (Only for Invited Members)
12:00-13:00	60	Lunch
13:00-15:00	120	Organizing Committee Meeting II (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 2021 WORLD CONGRESS ON
INFORMATION TECHNOLOGY, APPLICATIONS
AND SERVICES

(WORLD IT CONGRESS 2021)

Day 1, Feb. 18, 2021 (Thursday)

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

09:00-10:20   <u>Seesion A-1</u> **Presentation of young researchers**
(HALL A)
(Chair: Pradip Kumar Sharma)

1. **Content-consistent Adversarial Learning Method for Medical Image Segmentation**
   Zuyu Zhang, Yan Li, Byeong-Seok Shin
2. **Personalized Movie Recommendation based on K-mean Algorithm using R**
   Sony Peng, Doo-Soon Park, Yixuan Yang, Min-Pyo Hong
3. **Energy Efficient Mobile Edge Computing_Protocol Comparison**
   Jisu Park
4. **Design of a database architecture for AI-based network resource allocation**
   Kihyun Park, Seokhong Min
5. **Important Keyword Detection on Graph Centrality Analysis from CQI Documents**
   They Pheaktra, Joon-Min Gil
6. **Genetic-based keyword matching DBSCAN algorithm**
   Byoungwook Kim

10:20-10:30   **Coffee Break**

10:30-12:00   <u>Session A-2</u>
(HALL A)
(Chair: Byoungwook Kim)

1. **An Internet of Things Platform and Systems for Fire Management of Urban Buildings**
   Hyesun Lee, Sang Gi Hong, Sun-Hwa Lim, Kang Bok Lee
2. **Development of Chemical Injection Rate Automation System Based on Regression Analysis in Machine Learning for Smart Water Management System**
   Ho Yeon Kang, Syed Waseem Abbas Sherazi, Jong Yun Lee
3. **Machine Learning-based Prediction of Heart Failure in Patients with Acute Myocardial**

Infarction
Batireedui Baterdene, Sikandar Ali, Jong Yun Lee

4. **Reliability Improvement of IOT (Internet-Of-Things) sensing for Low-cost Fine Dust Concentration on Monitoring System of City Buses and Stations**
Dongmin Jang, Wonsu Kim, Sung Won Park

5. **FPGA Implemented edge detector with edge filtering module**
Yong Hyeon Kwon, Jae Wook Jeon

12:00-13:20   Lunch

13:20-14:00   <u>Invited Speaker</u>
(Chair: Yan Li)

> **Empowering Cognitive Security Systems with Cyber Situation Awareness**
>
> **Vincenzo Loia (Rector of University of Salerno)**
> Full professor of Computer Science
> Department of Business Science-Management and innovation Systems
> University of Salerno-Italy

14:00-14:10   Coffee Break

14:10-15:00   <u>Session A-3</u> HCIS Winter Workshop
(HALL A)
(Chair: Joon-Min Gil)

1. **Non-uniform Soft Tissue Simulation using Adaptive Tetrahedral Mesh**
Jion Kim, Koojoo Kwon, Byeong-seok Shin
2. **Static and Dynamic Malware Detection with Deep Learning Model**
Kyuwon Park, Jueun Jeon, Seungyeon Baek, Young-Sik Jeong
3. **Adaptive ECG Signal Compression Method Based on Look-ahead Linear Approximation for Ultra Long-Term Operating of Healthcare IoT Devices**
Seungmin Lee, Daejin Park
4. **AI-based dynamic network resource allocation for maximizing the network capacity of the cloud computing**
Seokhong Min
5. **Dynamic Region FP-Growth algorithm for Association Rule Mining**
Byoungwook Kim

15:00-15:10   Coffee Break

15:10-16:30   Session A-4
(HALL A)
(Chair: Koojoo Kwon)

1. **A Detection Algorithm of User's Maximum Trust Clique Based on Formal Concept Analysis in Social Network**
   Yixuan Yang, Doo-Soon Park, Fei Hao, Sony Peng, Hyejung Lee
2. **Experimental Study of YOLO Real-time Capability**
   Kwang-il Hwang, Jung-hun Lee, Sung-Su Lee
3. **The Improvement of SW Re-Programming by Comparison of Binary Files**
   Young Soo Do, Chang Young Jo, Jae Wook Jeon
4. **Ensemble PEI-based CNN Model For Behavior Recognition**
   Yeong-Hyeon Byeon, Keun-Chang Kwak
5. **Retrieving Nested Dataset Modification by Tracking Relevant Elements Based on Structured Scheme**
   Yongjin Kim, Yoosang Park, Jonghyeok Mun, Dohyung Kim, Jongsun Choi, Jaeyoung Choi

16:30-16:40   Coffee Break

16:40-18:00   Session A-5
(HALL A)
(Chair: Yan Li)

1. **A Blockchain-based Distributed Service Scenario for Smart Logistic Management using One Time Signature**
   Sushil Kumar Singh, S. Vimal, Jong Hyuk Park
2. **Lightweight and secure device management system for Smart City Network**
   Mikail Mohammed Salim, S. Vimal, Jong Hyuk Park
3. **OTP-based IPFS framework for secure IoT networks**
   Tae Woo Kim, Jong Hyuk Park
4. **Features Analysis of Tweets for Fake News Detection**
   Yonghun Jang, Dong-Gun Lee, Yeong-Seok Seo
5. **Spam Image Classification by Natural Language and Visual Resources**
   Seong-Guk Nam, Yeong-Seok Seo
6. **A Language Generative Model based Data Oversampling to Improve Bug Report Classification**
   Dong-Gun Lee, Yonghun Jang, Yeong-Seok Seo

Day 2, Feb. 19, 2021 (Friday)

10:00-12:00   **Organizing Committee Meeting I**

12:00-13:00   **Lunch**

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

# Day 3, Feb. 20, 2021 (Saturday)

10:00-12:00   **Executive Meeting – Organized by World IT Congress 2021**

12:00-13:00   **Lunch**

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

Conference Venue

MAISON GLAD JEJU

- MAISONGLAD JEJU Hotel
- 80, Noyeon-ro, Jeju-si, Jeju-do, Korea
- Front dest TEL +82-64-717-5000 / FAX +82-64-742-3150
- Reservation TEL +82-64-747-5000 / FAX +82642-742-3150

Web: https://maisongladjeju-hotels.com/en/web/maison
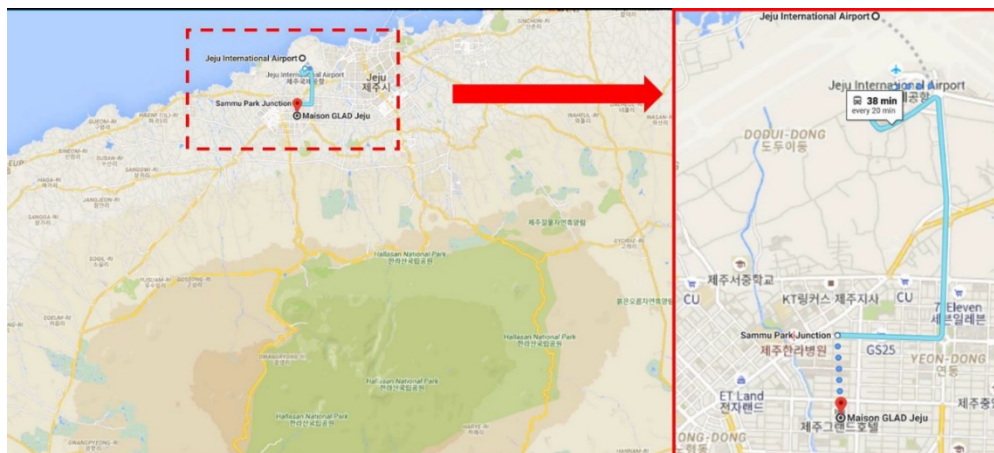
MUE 2021

The 15th International Conference on Multimedia and Ubiquitous Engineering

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

Introduction

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※ Because of COVID-19, online(video) presentation is allowed. After your paper was accepted, we will inform you the detailed information later thought homepage. (If the authors' country is non-Korea, the video presentation is strongly recommended).

Important date (Round II)

Submission Due: **Feb. 19. 2021**

Author Notification: Mar. 22, 2021

Conference Date: Apr. 22-24, 2021

MUE 2021

Publication & Special Issue

All accepted papers will be published by conference CD proceeding (without ISSN/ISBN).

After closing congress, accepted and presented papers will be recommended to

- Special Issues of the Intl' Journals indexed by SCIE/SCOPUS (30~50%)

Contact Information: mue2021.conf@gmail.com

KIPS
Korea Information Processing Society

KIPS CSWRG
Korea Information Processing Society
Computer Software Research Group

FutureTech 2021
The 16th International Conference on Future Information Technology

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

Introduction

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FutureTech

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