

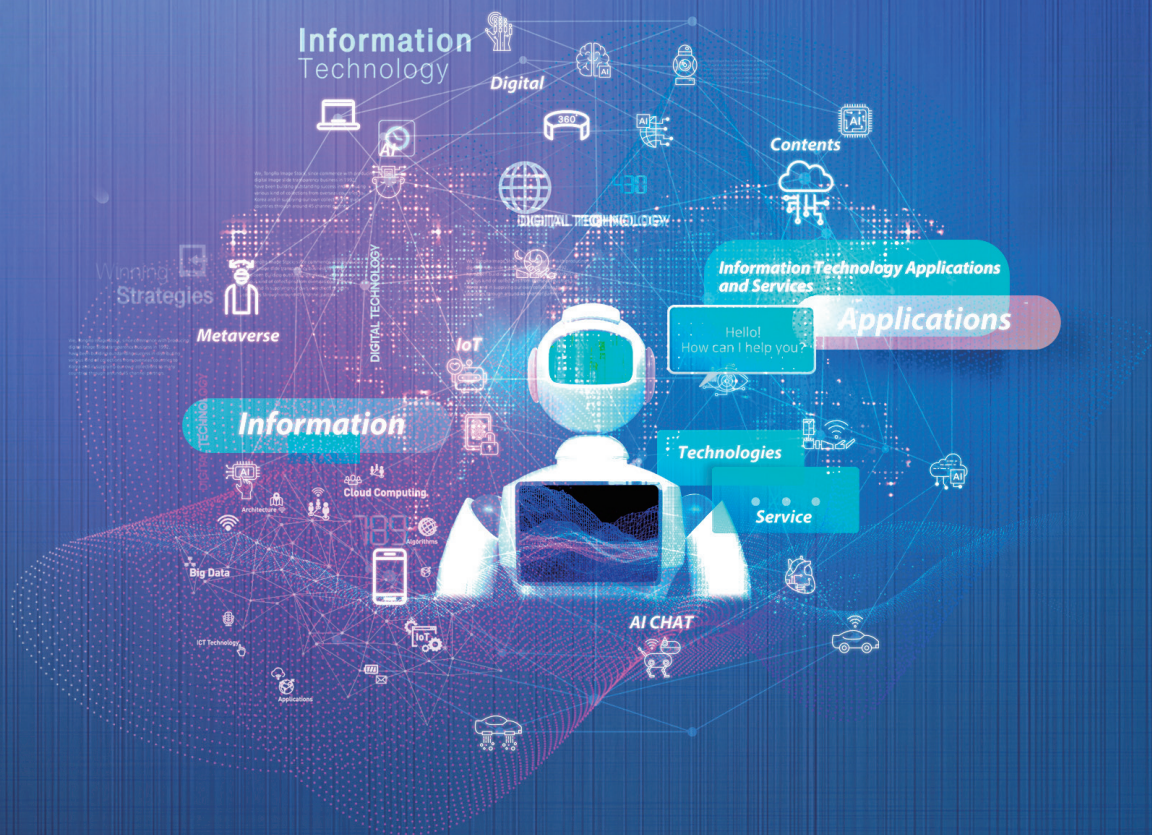
Program Book & Proceedings of the

World IT Congress

2024

The 2024 World Congress on
Information Technology Applications
and Services

February 14–16, 2024, Jeju, Korea



The 2024 World Congress on Information Technology Applications and Services

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

February 14-16, 2024
Jeju, Korea

Organized by

World IT Congress & KCIA & KIPS SWRG



2024 International Conferences
(Sponsored/Technically Sponsored by KCIA)

The 18th International Conference on Multimedia and Ubiquitous Engineering (MUE 2024)

- April 23-25 2024 (Chongqing, China)
- <http://www.mue-conference.org/2024/>

The 19th International Conference on Future Information Technology (FutureTech 2024)

- April 23-25 2024 (Chongqing, China)
- <http://www.futuretech-conference.org/2024/>

The International Conference on Big data, IoT, and Cloud computing (BIC 2024)

- August 12-14, 2024 (Hanoi, Vietnam)
- <http://www.bic-conference.org/2024/> (Unopened)

The 16th International Conference on Computer Science and its Applications (CSA 2024)

- Dec 18-20, 2024 (Pattaya, Thailand)
- <http://www.csa-conference.org/2024/> (Unopened)

General Chairs' Message from the World IT Congress 2024

The 2024 World Congress on Information Technology Applications and Services (World IT Congress 2024) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" will be held in Jeju, Korea on February 14~16, 2024. The World IT Congress 2024 is aimed at the address key themes on "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing." World IT Congress 2024 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 2024
General Chairs

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

Program Chairs' Message from the World IT Congress 2024

Welcome to the 2024 World Congress on Information Technology Applications and Services (World IT Congress 2024) - "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing", which will be held in Jeju, Korea on February 14~16, 2024. 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 2023 General Chairs for their advices to make possible organization of The World IT 2024. We would like to express special thanks to execute members for their timely unlimited support.

World IT Congress 2024
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Jin Wang, Changsha University of Science and Technology, China
Muhammad Khurram Khan, King Saud University, Kingdom of Saudi Arabia

Organization

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Michael Hwa Young Jeong, Kyung Hee University, Korea

Invited Speaker



Unmasking the Shadows: A Dive into Cutting-Edge Strategies against Disinformation in Online Social Networks

Prof. David Camacho

Universidad Politécnica de Madrid (UPM), Spain

Director of Applied Intelligence and Data Analysis research group

Abstract:

The spread of disinformation and misleading information in online social networks (OSN) has become a significant issue, causing harm at individual, community, and national levels. The rapid, and uncontrolled, dissemination through online social networks has created an environment for the proliferation of falsehoods, rumors, propaganda, and deceit, impacting the economy, politics, and health in recent decades. Addressing this challenge requires a comprehensive, multimodal approach involving various stakeholders such as individuals, media organizations, governments, technology companies, and researchers. This keynote aims to provide insights into the associated challenges and explore how Artificial Intelligence, Machine Learning and Social Network Analysis techniques are being used to combat disinformation. The keynote will specifically focus on two main areas: NLP and Multimodal DL architectures. The natural language processing, under the fact-check architecture (a solution utilizing ensembles and deep learning based on Transformers technology) will be presented to show how NLP and SNA can be effectively integrated to detect both misleading content and how it is spreading through the OSN. On the other hand, new deep learning models, designed to analysis and fusion multimodal (images and video) information, will be presented. This second architecture is used to analyse posts, which is a challenging task, due to the diverse information modalities, including text and images. To address this, a proposed multimodal architecture is introduced for identifying manipulated posts. The model is trained on a large-scale multimodal dataset encompassing image, caption, comments, and metadata. A coding system for comments is proposed to capture both semantics and tree structure. Utilizing a deep learning early fusion technique with CLIP as a pretrained encoder, hidden representations are combined based on the information channel, processing both multimodal and unimodal representations. Finally, some future trends and challenges related to the problem of detecting and combating misinformation will be presented.

Biography:

David Camacho is Full Professor at Computer Systems Engineering Department of Universidad Politécnica de Madrid (UPM), he is the head of the Applied Intelligence and Data Analysis research group, the Director of the PhD program in Computer Science and Technologies of Smart Cities, and the Director of the Master program in Machine Learning and Big Data at UPM. He has published more than 300 journals, books, and conference papers. His research interests include Machine Learning (Clustering/Deep Learning), Computational Intelligence (Evolutionary Computation, Swarm Intelligence), Social Network Analysis, Fake News and Disinformation Analysis. He has participated/led more than 60 AI-based R&D projects (National and International: H2020, MCSA ITN-ETN, DG Justice, ISFP, NRF Korea), applied to real-world problems in areas as aeronautics, aerospace engineering, cybercrime/cyber intelligence, social networks applications, disinformation countering, or video games among others. He serves as Editor in Chief of Expert Systems from 2023 and sits on the Editorial Board of several journals including Information Fusion, Human-centric Computing and Information Sciences (HCIS), and Cognitive Computation, IEEE Transactions on Emerging Topics in Computational Intelligence (IEEE TETCI), among others.

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PROGRAM SCHEDULE FOR WOLRD IT CONGRESS 2024

Day 1, February 14, 2024		
Time	Min	HALL A
09:00-09:20	20	Registration
09:20-11:00	100	Session A-1 WITC 2024 Chair: Abir El Azzaoui
11:00-11:10	10	Coffee Break
11:10-12:50	100	Session A-2 HCIS 2024 Winter Workshop Chair: Joon-Min Gil
12:50-14:00	70	Lunch
14:00-14:50	50	Keynote Speech David Camacho “Unmasking the Shadows: A Dive into Cutting-Edge Strategies against Disinformation in Online Social Networks” Chair: Kwang-il Hwang
14:50-15:00	10	Coffee Break
15:00-16:30	90	Session A-3 (Private) DMLAB Workshop Chair: Nammee Moon
16:30-16:40	10	Coffee Break
16:40-18:00	80	Session A-4 (Private) SICNS Workshop for NRF Korea - EU
18:00-18:30	30	Break
18:30-20:30	120	Banquet (Only for Invited Members)

Day 2, February 15, 2024		
Time	Min	HALL A
10:00-12:00	120	Session A-5 WITC 2024 Chair: Ji Su Park
12:00-13:30	90	Lunch
13:30-15:30	120	Organizing Committee Meeting I
15:30-16:00	30	Break
16:00-18:00	120	Executive Meeting – Organized by World IT Congress 2024

Day 3, February 16, 2024		
Time	Min	HALL A
09:00-10:20	80	Local Arrangement Committee Meeting
10:20-10:40	20	Break
10:40-12:00	80	Organizing Committee Meeting II

1. A paper presentation should be made by one of authors of the paper for 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.
4. For Q&A in the online section, please email the author.

**DETAILED SCHEDULE FOR
THE 2024 WORLD CONGRESS ON
INFORMATION TECHNOLOGY, APPLICATIONS
AND SERVICES
(WORLD IT CONGRESS 2024)**

Day 1, Feb. 14, 2024 (Wednesday)

09:00-09:20 Registration

**09:20-11:00 Session A-1 WITC 2024
(Chair: Abir El Azzaoui)**

- 1. Deep Learning-based Personalized ECG Monitor**
Chunghwan Hwang, Nagyoun An, Jaehyun Park
- 2. Joinable Tabular Data Search with Table Embedding**
Yoonseok Choi, Han-joon Kim
- 3. RNN-Based Modeling of Time-Series Health Information with Knowledge Graph Integration**
Jianing Zhao, Jong Hyuk Park, Qun Jin
- 4. Effective Combination of Contextual Embedding based Tensor Space Model and Transformer for Text Classification**
SoonKwan Kwon, Han-joon Kim
- 5. Container-based platform deployment system for real-time multi-user action sharing in virtual reality**
Gi Woo Hyun, Ji Won Oak, Dong Hoon Kim, Kun Woo Kim
- 6. Algorithm for Mining Maximal Balanced Bicliques using Formal Concept Analysis**
Sadriddinov Ilkhomjon, Sony Peng, Sophort Siet, Daeyoung Kim, Doo-Soon Park
- 7. Multimodal Analysis for Identifying Misinformation in Social Networks**
Adrián Girón, Javier Huertas-Tato, Jong Hyuk Park, David Camacho
- 8. Scalability analysis of DeepVATS: A Framework for Deep Learning Visual Analytics on Large Time Series Data**
Inmaculada Santamaria-Valenzuela, Víctor Rodriguez-Fernandez, Jong Hyuk Park, David Camacho
- 9. A Study on OSS License Compatibility Verification using LLMs in MSA**
Dupyo Hong, Dongwan Kim, YongJoon Joe, DongMyung Shin

11:00-11:10 Coffee Break

**11:10-12:50 Session A-2 HCIS 2024 Winter Workshop
(Chair: Joon-Min Gil)**

- 1. Audiovisual-based Surveillance System for Detecting Physical Leaks in Research and Development Environments**
Yuna Han, Hangbae Chang



2. **Data Gathering System for Identifying Insider Threat Behavior on Windows System**
Giwan Hong, Jawon Kim, Yuna Han, Hangbae Chang
3. **Towards an Conceptual Framework for Quantum City Development through QICT**
Seo Yeon Moon, Jong Hyuk Park
4. **GPU memory usage limiting techniques for running multiple AI jobs in the container environments**
Jihun Kang, Joon-Min Gil
5. **Proactive Container Autoscaling using DEVS for Efficient Cloud-Native Computing**
Byeonghui Jeong, Jueun Jeon, Young-Sik Jeong
6. **Methodology for Identifying Promising Items Based on Deep Learning**
Jeongeun Byun, Kuk Jin Bae, Sumin Seo, Eun Sun Kim
7. **A Lightweight Depth-wise ResNet-SE for Human Activity Recognition**
Seoungwoo Jang, Im Y. Jung
8. **Development of method for predicting changes in body shape based on deep learning**
Minji Kim, Sekyoung Youm
9. **Development and Evaluation of a Digital Therapeutic Using 3D Artificial Intelligence Technology for Visual Weight Loss and Health Improvement**
Hyunsook Lee, Sekyoung Youm

12:50-14:00 Lunch

14:00-14:50 Invited Speaker
(Chair: Kwang-il Hwang)

Prof. David Camcho

“Unmasking the Shadows: A Dive into Cutting-Edge Strategies against Disinformation in Online Social Networks”

Universidad Politécnica de Madrid (UPM), Spain

Director of Applied Intelligence and Data Analysis research group

14:50-15:00 Coffee Break

15:00-16:30 Session A-3 DMLAB Workshop
(Chair: Nammee Moon)

1. **Self-Training Pet Behavior Prediction Based on Pseudo Label**
JunHyeok Go, Nammee Moon
2. **Efficient Real-time Audio Analysis: The FTAE Model for Faster Early Fusion**
Jin Hwan Yang, Huck Soon Choi, Sung Sik Kim, Nammee Moon
3. **Time-Series Augmentation Using Diffusion Model for Improved Sensor Data Training**
Jeong Hyeon Park, Nammee Moon
4. **EfficientNetV2 and DistilBERT-Based Feedback Model for Intelligent Waste Sorting**
SiUng Kim, Nammee Moon
5. **Enhancing Pet Behavior Classification: A Fusion of VAE and RESNET-LSTM Models**
Hyuk Soon Choi, Sung Sik Kim, Jin Hwan Yang, Nammee Moon

16:30-16:40	Coffee Break
16:40-18:00	<u>Session A-4</u> SICNS Workshop for NRF Korea-UE Privacy Session
18:00-18:30	Break
18:30-20:30	Banquet (Only for Invited Members)

Day 2, Feb. 15, 2023 (Thursday)

10:00-12:00 **Session A-5** WITC 2024
(Chair: Ji Su Park)

1. **Application of Transfer Learning-based Binary Classification Model for Data Augmentation**
Ji Su Park
2. **DT-IDS: Digital Twin enabled Intrusion Detection System for IoT Networks**
Salim Mikail Mohammed, Heeji Park, Jong Hyuk Park
3. **Market prediction model based on fuzzy logic system in smart city environment**
Abir El Azzaoui, Jong Hyuk Park
4. **OTP Empowered Blockchain for Secure Network Communication in Smart City Environment**
Jimin Ha, Jong Hyuk Park
5. **Quantum-based ARP anti-spoofing methods for Data Link Layer communications**
Byung Hyun Jo, Jong Hyuk Park
6. **Securing V2X Communication: A Machine Learning-Enabled Blockchain Framework**
Yonas Teweldemedhin Gebrezgihera, Jong Hyuk Park
7. **Blockchain-based Digital Forensics framework for preventing Cyber Attacks in Metaverse**
Tuba Arif, Jong Hyuk Park

12:00-13:30	Lunch
13:30-15:30	Organizing Committee Meeting I
15:30-16:00	Break
16:00-18:00	Executive Meeting – Organized by World IT Congress 2024

Day 3, Feb. 16, 2024 (Friday)

09:00-10:20 Local Arrangement Committee Meeting

10:20-10:40 Break

10:40-12:00 Organizing Committee Meeting II

Conference Venue



LOTTE City Hotel Jeju

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