

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

December 18-20, 2024  
Pattaya, Thailand

Organized by

**KCIA**

## Conferences

### **The 10th World Congress on Information Technology Applications and Services (World IT Congress 2025)**

- February 17-19, 2025, Jeju, South Korea
- <http://www.worlditcongress.org2025/>

### **The 19th International Conference on Multimedia and Ubiquitous Engineering (MUE 2025)**

- April 24-26 2025, Changsha, China
- <http://www.mue-conference.org/2025/>

### **The 20th International Conference on Future Information Technology (FutureTech 2025)**

- April 24-26 2025, Changsha, China
- <http://www.futuretech-conference.org/2025/>

### **The International Conference on Big data, IoT, and Cloud computing (BIC 2025)**

- Aug 13-15, 2025, Phnom Penh, Cambodia
- <http://www.bic-conference.org/2025/>

### **The 17th International Conference on Computer Science and its Applications (CSA 2025)**

- Dec 18-20, 2025
- <http://www.csa-conference.org/2025/>

## Message from the CSA 2024 General Chair

International Conference on Computer Science and its Applications (CSA 2024) is the 16th event of the series of international scientific conference. This conference takes place Pattaya, Thailand, December 18 - 20, 2024. CSA 2024 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications. CSA 2024 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 2024 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2023(15th Edition: Nha Trang, Vietnam, 2023), CSA 2022(14th Edition: Vientiane, Laos, 2022), CSA 2021(13th Edition: Jeju, Korea, 2021), CSA 2020 (12th Edition: Jeju, Korea, 2020), 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 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.

We would like to give my special thanks to Prof. James J. (Jong Hyuk) Park, Prof. Young-Sik Jeong, Prof. Nammee Moon, Prof. Yi Pan, Prof. Vincenzo Loia, Prof. Stefanos Gritzalis, Prof. Han-Chieh Chao and Prof. Byeong-Seok Shin the Steering Committee Chairs of CSA for their strong encouragement and guidance to organize the symposium. We would like to thank CSA Program Chairs: Prof. Ji Su Park, Prof. Yan Li, Prof. S. Vimal, Prof. Alireza Souri, Prof. Le Anh Ngoc, Prof. Neil Yen and Prof. Jin Wang. We would like to express special thanks to committee members for their timely unlimited support.

CSA 2024 General Chair

Jungho Kang, Baewha Woman University, Korea  
Kim-Kwang Raymond Choo, The University of Texas at San Antonio, USA  
Changhao Piao, Chongqing University of Posts and Telecommunications, China  
David Camacho, Universidad Politécnic de Madrid Madrid, Spain

## Message from the CSA 2024 Program Chairs

Welcome to the 16th International Conference on Computer Science and its Applications (CSA 2024) which will be held in Pattaya, Thailand, December 18 - 20, 2024. CSA 2024 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications.

CSA 2024 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 2024 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2023(15th Edition: Nha Trang, Vietnam, 2023), CSA 2022(14th Edition: Vientiane, Laos, 2022), CSA 2021(13th Edition: Jeju, Korea, 2021), CSA 2020 (12th Edition: Jeju, Korea, 2020), 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 2024 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. Young-Sik Jeong, Prof. Nammee Moon, Prof. Yi Pan, Prof. Vincenzo Loia, Prof. Stefanos Gritzalis, Prof. Han-Chieh Chao and Prof. Byeong-Seok Shin the Steering Committee Chairs of CSA for their strong encouragement and guidance to organize the symposium. We would like to thank CSA 2024 General Chairs: Prof. Jungho Kang, Prof. Kim-Kwang Raymond Choo and Prof. Piao Changhao and Prof. David Camacho. We would like to express special thanks to committee members for their timely unlimited support.

CSA 2024 Program Chairs

Ji Su Park, Jeonju University, Korea

Yan Li, Inha University, Korea

S. Vimal, Ramco Institute of Technology, India

Alireza Souri, Islamic Azad University, Iran

Le Anh Ngoc, Swinburne University of Technology, Vietnam

Neil Yen, University of Aizu, Japan

Jin Wang, Hunan University of Science & Technology, China

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Alireza Souri, Islamic Azad University, Iran  
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Hyun Woo Kim, Dongguk University, Korea  
Jong Beom Lim, Pyeongtaek University, Korea  
Yeong-Seok Seo, Yeungnam University, Korea  
Ki Yong Lee, Sookmyung Women's University, Korea  
Jong Hyuk Lee, Daegu Catholic University, Korea

## Invited Speaker 1



### Towards Efficient and Scalable RDMA Networking for Datacenters

**Prof. Jin Wang**

School of Computer Science and Engineering,  
Hunan University of Science and Technology, Hunan, China

#### Abstract:

As datacenters continue to scale and evolve, the demand for high-performance, low-latency networking solutions has become increasingly critical. Remote Direct Memory Access (RDMA) technology has emerged as a key enabler for achieving these performance goals, offering direct memory access from the memory of one computer into that of another without involving either one's operating system. In this keynote, we will explore the latest advancements in RDMA networking, focusing on efficiency and scalability in large-scale datacenter deployments. We will discuss the fundamental principles of RDMA technology and its benefits over traditional networking approaches, including reduced latency, increased throughput, and lower CPU utilization. Key challenges in implementing RDMA at scale, such as congestion control, fault tolerance, and interoperability with existing network infrastructure, will be addressed. Attendees will gain insights into practical deployment considerations, real-world case studies, and performance benchmarking results that demonstrate the tangible benefits of RDMA in large-scale datacenter applications. By the end of this keynote, participants will have a comprehensive understanding of how to leverage RDMA technology to build efficient, scalable, and high-performance networking infrastructures capable of meeting the demands of next-generation datacenters.

#### Biography:

Dr. Jin Wang (IET Fellow; IEEE Senior Member) is a professor in School of Computer Science and Engineering at Hunan University of Science and Technology. He received the M.S. degree from Nanjing University of Posts and Telecommunications, China in 2005. He received Ph.D. degree from Kyung Hee University Korea in 2010. His research interests mainly include wireless ad hoc and sensor network, datacenter network, network performance analysis and optimization etc. He has published more than 200 international journal and conference papers, such as IEEE TSMC, IEEE TII, IEEE IoTJ, IEEE Wireless Communications, IEEE Systems Journal etc., including more than 20 highly cited papers. He is the Highly Cited Researcher in the world (Clarivate), the Highly Cited Scholar in China (Elsevier) as well as the World's Top 2% Scientist.



## Invited Speaker 2



### Secure IoT-driven Smart City: Futuristic Next Generation Technologies using Advanced Communication

**Dr. Sushil Kumar Singh**

Associate Professor,  
Department of Computer Engineering,  
Marwadi University, Rajkot, Gujrat, India  
UCS Lab Leader (Ex.), SeoulTech, South Korea

#### Abstract:

In the rapidly evolving landscape of metropolitan development, Smart Cities stand at the forefront of technological invention, promising enhanced quality of life through advanced connectivity and intelligent infrastructure. State-of-the-art advanced communication technologies, including the upcoming 6G networks, promise to deliver outstanding speeds, ultra-reliable low latency, and tremendous connectivity, marking a significant leap from its predecessor, 5G. This next-generation network technology will enable unprecedented data transfer rates and connectivity, facilitating the seamless integration of millions of IoT sensor devices across intelligent city infrastructures. However, with the proliferation of connected devices and data flows, security concerns become essential. This keynote lecture explores the critical importance of robust cybersecurity measures to protect sensitive data and ensure the resilience of smart city systems against cyber threats. We will examine state-of-the-art security protocols and technologies, including blockchain, AI-driven threat detection, digital twin-based virtual environment, and end-to-end encryption, essential to protecting the integrity of smart city operations and the security measures required to protect smart city infrastructures from cyber threats. The convergence of these technologies will not only enhance operational efficiency but also immensely improve the quality of life for city inhabitants.

#### Biography:

Dr. Sushil Kumar Singh (Member, IEEE) is an Associate Professor in the Department of Computer Engineering at Marwadi University, Rajkot, India. He received Ph.D. degree from Seoul National University of Science and Technology, Seoul, South Korea. He received M.Tech. Degree in Computer Science and Engineering from Uttarakhand Technical University, Dehradun, India. He also received an M.E. degree in Information Technology from Karnataka State University, Mysore, India. He has also been the lab leader of the UCS Lab at the Department of Computer Science Engineering, Seoul National University of Science and Technology, Seoul, South Korea. He has received the Best Lab Leadership Award from UCS Lab for 2019-2021. He has more than 12 years of experience teaching in the field of computer science. He has published Four Books: Computer C Programming, Cyber Security, Big Data Analytics, and Mobile Computing. He has also published many high-quality papers (Q1, Top 10% JCR Rank) in international journals and conferences. He has already delivered international lectures in many countries. His research interests include Blockchain, Artificial

Intelligence, Big Data, Internet of Things, Smart City Security, and Cyber-Physical Systems. He is an Associate/ Guest Editor in the Human-centric Computation and Information Sciences (HCIS) Journal, IEEE Journal of Biomedical and Health Informatics (IEEE JBHI) Journal, IGI Global Publication, and Wiley Scrivener Publication. He is a reviewer of the IEEE Wireless Communication Magazine, IEEE SYSTEMS, IEEE Internet of Things, FGCS, TETT, EXSY, JISA, Computer Network, MDPI, CIE, HCIS, JIPS, Computing (COMP), Multimedia Tools & Applications, and SCIS Journal. He also organizes the Research Activities Club, which promotes quality research activities among young researchers at Marwadi University, Rajkot, Gujarat, India.

## Invited Speaker 3



### Key Technology of Connected Remote Valet Parking

**Prof. Changhao Piao**

Chief Scientist of Chinese Ministry of Science and Technology,  
College of Automation Engineering,  
Chongqing University of Posts and Telecommunications, Chongqing,  
China.

#### **Abstract:**

With the rapid development of intelligent cars, the autonomous valet parking technique has significant application value in intelligent cyber-physical transportation systems. The 5G-V2X-based off-site dispatching enhanced remote automotive valet parking (E-AVP) is the crystallization of the deep integration of network intelligence and single-vehicle intelligence, and is an important way to achieve L4 level autonomous driving. The construction of an enhanced remote valet parking system is a complex systems engineering. This talk will introduce the basic concept, system architecture, electrical architecture, operating system and the corresponding supporting technologies for the construction of an E-AVP system. The presentation will cover interactive decision-making methods, parking guidance ways, parking trajectory planning strategies, and blockchain communication algorithms of the E-AVP system in detail. Moreover, significant demonstration results will be shared with all.

#### **Biography:**

Dr. Changhao Piao (Chief Scientist of Chinese Ministry of Science and Technology) is a professor in College of Automation Engineering, Chongqing University of Posts and Telecommunications (CQUPT). He received Ph.D. degree from INHA University, Korea in 2006. His research interests mainly include intelligent vehicles, electric vehicles etc. He has published more than 50 international journal, such as IEEE TII, Journal of Energy Storage etc. As a Chief Scientist of Chinese Ministry of Science and Technology, he are leading a National key R&D program.

# PROGRAM SCHEDULE FOR CSA 2024

Day 1, December 18, 2024				
Time	Min	HALL A	HALL B	HALL C
08:40-09:00	20	Registration		
09:00-10:20	80	<b>Session A-1</b> CSA Chair: Joon-Min Gil	<b>Session B-1</b> CSA Chair: Deok-Gyu Lee	<b>Session C-1</b> CSA Chair: Ji Su Park
10:20-10:30	10	Coffee Break		
10:30-11:50	80	<b>Session A-2</b> CSA Chair: Mingjie Liu	<b>Session B-2</b> CSA Chair: Ping Liu	<b>Session C-2</b> BWW Workshop Chair: Se Dong Min
11:50-13:10	80	Lunch		
13:10-14:50	100	<b>Session A-3</b> CSA Chair: Sheng Miao	<b>Session B-3</b> CAABE Workshop Chair: Yan Li	<b>Session C-3</b> BWW Workshop Chair: Se Dong Min
14:50-15:00	10	Coffee Break		
15:00-16:40	100	<b>Session A-4</b> CSA Chair: Jin Gon Shon	<b>Session B-4</b> CAABE Workshop Chair: You Li	<b>Session C-4</b> BWW Workshop Chair: Se Dong Min
16:40-18:00	80	Break		
18:00-18:40	40	<b>Keynote Speaker</b> Chair: Kwang-il Hwang		
18:40-20:00	80	<b>Banquet</b> Chair: Kwang-il Hwang		

Day 2, December 19, 2024			
Time	Min	HALL A	HALL B
08:40-09:00	20	Registration	
09:00-10:40	100	Session A-1 CSA Chair: Yan Li	Session B-1 CAABE Workshop Chair: Sheng Miao
10:40-10:50	10	Coffee Break	
10:50-12:30	100	Session A-2 BWW Workshop Chair: Se Dong Min	Session B-2 CAABE Workshop Chair: Sheng Miao
12:30-13:30	60	Break	
13:30-15:00	90	Local Arrangement Committee Meeting 1	
15:00-15:30	30	Break	
15:30-17:00	90	Organizing Committee Meeting 1	

Day 3, December 20, 2024			
Time	Min	HALL A	
09:30-11:00	90	Organizing Committee Meeting 2	
11:00-12:30	90	Local Arrangement Committee Meeting 2	

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 7/10 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.
5. Committee Meeting Only invited members may attend.

# DETAILED SCHEDULE FOR THE 14TH INTERNATIONAL CONFERENCE ON COMPUTER SCIENCE AND ITS APPLICATIONS (CSA 2024)

Day 1, December 18, 2024 (Wednesday)

08:40-09:00 Registration

09:00-10:20 On/Off Session A-1  
(HALL A)  
(Chair: Joon-Min Gil)

- 1. An Authentication Protocol for Integrating Body Sensor Networks and Internet of Vehicles**  
*Xiangwei Meng, Shu Tan, Wei Liang, Xiaoliang Wang, Meiguo Ke, Jin Wang*
- 2. A SAC-based Incentive Mechanism for Service Provider in Vehicle Edge Computing**  
*Dun Cao, Shirui Huang, Jiasi Xiong, Jin Wang*
- 3. Resource management and scheduling technology based on domestic server operating system**  
*Jungang Ji, Dacheng He, Kefei Li, Yingzi Huo, Xiaoliang Wang, Lijun Xiao*
- 4. Overview of Quantum Communication Based on the Ocean**  
*Yuexing Zhang, Wei Liang, Shiliang Huang, Hongding zhang, Naixue Xiong*
- 5. Smart Farming with Machine Learning: Transforming Disease Monitoring and Crop Health Management**  
*Himanshu Gupta, Aryan Vashisth, Meena Kumari*

09:00-10:20 On/Off Session B-1  
(HALL B)  
(Chair: Deok-Gyu Lee)

- 1. State of Health Estimation for Batteries Based on CNN-LSTM-KAN Model with Real-World Data**  
*Qingsong Liu, Junsheng Chen, Mingjie Liu, Changhao Piao, Rongli Sun, Heajin Hwang, Incheon Hwang*
- 2. A Comparative Analysis of Deep Learning Techniques for Android Spyware Classification**  
*Chaowat Leenopparat, Wilawan Rukpakavong*
- 3. Paper-Keyword Graph Framework for Research Papers Classification using GCN Model**  
*Dipto Biswas, Tae-Young Byun, Joon-Min Gil*
- 4. Comprehensive Study on 6G Security Issues and Countermeasures**  
*Minji Kim, Jong Hyuk Park*

- 5. TSPG: Predicting Factory Electricity Consumption based on Novel Transformer Structure**  
*Yongmei Hu, Chang Ruan, Ran Hu, Xuan Nie*
- 6. Performance Evaluation of Mobility in Non-Terrestrial Networks**  
*Li-Sheng Chen, Shu-Han Liao*

**09:00-10:20**    **On/Off Session C-1**  
**(HALL C)**  
**(Chair: Ji Su Park)**

- 1. A Comprehensive Comparative Study of Crop Yield Prediction Using Advanced Machine Learning Techniques**  
*Bakkialakshmi. V.S*
- 2. GENI: A Multi-Module AI Assistant**  
*Bakkialakshmi. V.S*
- 3. SAGA-Integrating AI for Enhanced Recruitment: A System with Audio-Video Proctoring and Comprehensive Evaluation**  
*Bakkialakshmi. V.S1*
- 4. Body Gesture Recognition Using Crow Search Algorithm Enhanced Probabilistic Neural Network for Human-Computer Interaction**  
*Bakkialakshmi. V.S1*
- 5. Unet Stream for Segmentation of Ultrasound Images of Breast Cancer**  
*Suman Sharma, Stanislav Makhanov*
- 6. Movable Integrated Heat Pipe Thermoelectric Systems for Eliminating Localized Hotspots in Data Centers**  
*Zhuoluo Pei, Hang Yu*

**10:20-10:30**    **Coffee Break**

**10:30-11:50**    **Session A-2**  
**(HALL A)**  
**(Chair: Mingjie Liu)**

- 1. Development of an Attack Case Generation Model Based on the Characteristics of Digital Assets of Nuclear Power Plants**  
*Minseok Hur, Eunji Lee, Sooyon Seo, Jaeho Hwang, Dongmin Kim, Moohong Min, Aram Kim*
- 2. Analysis of FPGA Development Processes and Associated Security Threats**  
*Minseok Hur, Jiho Shin, Moohong Min, Aram Kim*
- 3. Pest Classification Model using MobileNet V2 and CBAM**  
*Seon-Ja Lim, Jae-Hyen Kim, Yeong-Rak Choi, Philjoo Choi, Sang-Kyu Park, Bo-Sung Kim, Ki-Ryong Kwon*
- 4. Applying Variational Quantum Classifier to Enhance the Effectiveness of Imported Food Safety Management**  
*Seongjun Kwon, Sang Ji Kwon, JiHye Huh, Sangho Choi, Ohbyung Kwon*
- 5. Exploring Data Publishing Process Options for Data Papers and Datasets**  
*Sungsoo Ahn, Youngim Jung*

**10:30-11:50    Session B-2**  
**(HALL B)**  
**(Chair: Ping Liu)**

- 1. Deep Learning Techniques for Enhancing the Efficiency of Security Patch Development**  
*Zeinab Shahbazi, Meshkat Mesbah*
- 2. YOLO-LFFE: A Lightweight Fish Detection Model Based on Feature Enhanced Fusion**  
*Dengyong Zhang, Hui He, Shen Gao, Ji han xu, Yi jun Wang*
- 3. An Improved Chaos-DCT and SVD Algorithm for Invisible Watermarking of Medical Images**  
*Weida Zhang, Jian Peng, Dengyong Zhang*
- 4. Modeling Manuscript States and Events in a State Machine Diagram**  
*Sungsoo Ahn, Duksan Ryu*
- 5. Heliumspeech Unscrambling Algorithm Based on Multi-objective Optimization of Phonemes**  
*Shibing Zhang, Kenan Zhou*
- 6. Development and Enhancement of a Comprehensive Parking Management System**  
*Karan Sota*

**10:30-11:50    Session C-2**  
**(HALL C)**  
**(Chair: Se Dong Min)**

- 1. The Impact of Inertial Sensor Location and Count on Human Activity Recognition Using Deep Learning Approaches**  
*Rathna Damsmoun, Hanifah Rahmi Fajrin, Seungwan Jang, Young Kim, Se Dong Min*
- 2. Analysis of the Correlation Between Sleep Efficiency and Biometric Signals Across Different Races**  
*Yujin Oh, Ji Hee Choe, Ye Eun Kong, A Hyun Jung, Young Kim, Se Dong Min*
- 3. Estimating Joint Angles of the Lower Extremity Using Ground Reaction Force and Foot Inertial Measurements**  
*Seungmin Jeong, Zoghlami Rania, Young Kim, Se Dong Min*
- 4. Efficient Defect Detection in Textile Materials Using YOLO-v10**  
*Makara Mao, Taeheon Kim, Sungyeup Kim, Jaehyoun Kim, Min Hong*
- 5. Cutting Simulation of Deformable Objects in Unity 3D**  
*Lyudmila Khan, Min Hong*
- 6. A Survey on AI-Based Anomaly Detection for Cloud Security in IIoT Environments**  
*Jungho Kang*

**11:50-13:10    Lunch**



**13:10-14:50    Session A-3**  
**(HALL A)**  
**(Chair: Sheng Miao)**

- 1. An Overview of Quantum Clustering Algorithms**  
*Weiqing Long, Yufeng Xiao, Silong Li, Wei Liang, Dacheng He, Naixue Xiong*
- 2. A Novel Strategy for Difficulty Estimation in the Guitar Fingering Problem**  
*Yen-Chia Kuo, Jiang-Yi Zeng, Min-Yan Tsai, Fan-Hsun Tseng, Chi-Yuan Chen, Shih-Yun Huang, Hsin-Hung Cho*
- 3. A multi-scenario driving range prediction method for electric vehicles in low temperature**  
*Rongli Sun, Jilong Xie, Changhao Piao, Ping Liu, Qingsong Liu*
- 4. QML-based Distributed Architecture for Secure IoT-driven Smart Farming using Advanced Communication**  
*Sushil Kumar Singh, Manish Kumar*
- 5. A Privacy-Preserving Protocol for Secure Marine Data Sharing: Integrating Zero-Knowledge Proofs and Secure Multiparty Computation in Blockchain**  
*Ankit Kumar, Jong Hyuk Park*
- 6. Hidden Malware Detection Framework for Securing IoT Devices in Smart Factory**  
*Abir El Azzaoui, Mikail Mohammed Salim, Na Yeong Kim, Jong Hyuk Park*
- 7. Strategies for Next-Generation Network Security Enhancement through Quantum Cloud and Blockchain Integration**  
*Mikail Mohammed Salim, Jong Hyuk Park*
- 8. A Study on AI-Based Network Security Framework for Intelligent Threat Mitigation**  
*ARIF TUBA, Jong Hyuk Park*

**13:10-14:50    On/Off Session B-3: CAABE Workshop**  
**(HALL B)**  
**(Chair: Yan Li)**

- 1. Vehicle and pedestrian detection for UAV platform based on deep learning**  
*Ang Sha, Zhiguo Che, Xiaolin Zang, Wei Zhao, Fuen Xue, Yong Zhang*
- 2. Multi-Label Prediction of Resident Satisfaction Based on Combinatorial Model**  
*Ang Sha, Wei Zhao, Xiaolin Zang, Zhiguo Che, Fuen Xue, Yong Zhang*
- 3. Analysis of energy consumption drivers in building rooms: A case of the commercial complex in Chengdu**  
*Huiyang Zhong, Haonan Ma, Pengcheng Hu, Xiaojie Zhou, Xucheng Zhuang, Yulei Lin, Peiqi Zhang, Yihang Ji, Jixin Zou, Ning Wang, Guodan Liu*
- 4. Analysis of factors affecting air conditioning energy consumption: The case study of a commercial building in Shenzhen**  
*Pengcheng Hu, Yihang Ji, Huiyang Zhong, Xiaojie Zhou, Xucheng Zhuang, Peiqi Zhang, Yulei Lin, Haonan Ma, Jixin Zou, Ning Wang, Guodan Liu*
- 5. Comparative analysis of carbon emissions of LS-RRB and BC-RRB—— A case study from Zhejiang Province**  
*Runtian Shen, Yueyue Su, Xinyi Yang, Jiamin Yuan, Meiyang Wang*
- 6. Explore the use of virtual reality in restorative natural environment**  
*Xiaolin Ding, Xinyue Zhang, Weijun Gao, Hiroatsu Fukuda*

**7. Network Encryption Traffic Classification based on Residual Attention mechanism**

*Sihui Chen, Daoquan Li, Zheng Xu, Xulin Liu*

**13:10-14:50**    **Session C-3: BWW Workshop**  
**(HALL C)**  
**(Chair: Se Dong Min)**

- 1. A Study on Latency-Aware DRL Optimization for Maximizing Throughput in Vehicular Networks**  
*Rothny Mom, Seungwoo Kang, Sreyleak Sam, Sovanndoeur Riel, Seokhoon Kim*
- 2. GDRL-based adaptive resource management for network slicing in IIoT applications**  
*Seyha Ros, Seungwoo Kang, Taikuong Iv, Intae Ryoo, Seokhoon Kim*
- 3. Searching for Uncertain Maximal Bicliques: Formal Concept Analysis Approach**  
*Ilkhomjon Sadriddinov, Sony Peng, Sophort Siet, Daeyoung Kim, Kyuwon Park, Doo-Soon Park*
- 4. Hybrid Movie Recommendation Systems based on customized Work-Stealing and NCF for Effective Large-Scale System**  
*Sony Peng, Sophort Siet, Ilkhomjon Sadriddinov, Dae-Young Kim, Kyuwon Park, Doo-Soon Park*
- 5. Comparison of LSTM and Transformer model performance for network delay prediction**  
*Jae-Won Jang, So-Yeon Lee, Samia Zahid, Dae-Young Kim*

**14:50-15:00**    **Coffee Break**

**15:00-16:40**    **Session A-4**  
**(HALL A)**  
**(Chair: Jin Gon Shon)**

- 1. An Efficient Management of Digital Badge Using JWT**  
*Yong Il Kim, Ji Su Park, Jin Gon Shon*
- 2. Efficient Information Search Techniques for Similar Documents in AI Chatbots**  
*Hyun Cheon Hwang, Ji Su Park, Jin Gon Shon*
- 3. Channel State Information-based Distance Estimation System for Internet of Things**  
*Jung-Hyok Kwon, Eui-Jik Kim*
- 4. Defending Against Backdoor Attacks in Federated Learning Using Differential Privacy Combined with OOD Data Attributes**  
*Qingyu Tan, Yan Li, Byeong-Seok Shin*
- 5. Audio Noise Reduction Technique Using Deep Learning for Cave Rescue Application**  
*Nitchamon Sawangsawai, Prayoth Kumsawat, Somsak Vanit-Anunchai*
- 6. Obtaining and Processing Golf Ball Trajectory Data for Metaverse Golf Service**

*Dongho Kim*

**7. 2.5D Image-based Rendering for Augmented Reality Metaverse Content**

*Dongho Kim*

**15:00-16:40 Session B-4: CAABE Workshop**

**(HALL B)**

**(Chair: You Li)**

- 1. Research on the practical application of Intelligent Generative Design of Kindergarten Layout Plan**  
*Shuhan Zhu, Yeliang Song, Dongmiao Zhao, Xingtian Wang*
- 2. Smart City Management System Based on Unmanned Aerial Vehicle Real Time Target Detection**  
*Chuanlong Wang, Zishun Song, Xiang Shen, Sheng Miao*
- 3. Spatial Distribution of Kyushu's Solar Energy Resources**  
*You Li, Yafei Wang, Weijun Gao, Weisheng Zhou*
- 4. Energy Sharing Potential Analysis of Battery Energy Storage System in a Commercial Community**  
*Yafei Wang, You Li, Weijun Gao*
- 5. Numerical Simulation and Acoustic Emission Percolation Model for High-Temperature Granite After Liquid Nitrogen Cooling**  
*Chunbo Zhou, Jiuzhe Xu, Shanjie Su, Chengzheng Cai, Feng Gao*
- 6. A Study of Architectural Text Mining Corpus Refinement Method Based on BiLSTM and Active Learning Strategies**  
*Shaoyu Lu, Yansu Qi, Sheng Miao*

**15:00-16:40 Session C-4: BWW Workshop**

**(HALL C)**

**(Chair: Se Dong Min)**

- 1. A Study on Efficient GML-based OSS Detection of Source Code**  
*Seok-Joon Jang, Su-Hyun Kim, Im-Yeong Lee*
- 2. Robust Classification of Atopic Dermatitis Severity via Excitatory-Inhibitory Neural Analysis**  
*Eunbin Kim, Yoosang Baek, Onseok Lee*
- 3. Analytic Architecture for Cybersickness Detection Using EEG Signals**  
*Seula Kye, Onseok Lee*
- 4. Skin elasticity prediction based on image regression using hyperspectral images**  
*Juhyun Kim, Onseok Lee*
- 5. Classification of Atopic Dermatitis based on Domain Generalization**  
*Taeyeon Gil, Onseok Lee*

**16:40-18:00 Break**

**18:00-18:40 Keynote Speaker**

**(HALL A)**

**(Chair: Kwang-il Hwang)**

**“Towards Efficient and Scalable RDMA Networking for Datacenters”**

*Jin Wang*

**“Secure IoT-driven Smart City: Futuristic Next Generation Technologies using Advanced Communication”**

*Sushil Kumar Singh*

**“Key Technology of Connected Remote Valet Parking”**

*Changhao Piao*

**18:40-20:00 Banquet**  
**(HALL A)**  
**(Chair: Kwang-il Hwang)**

**Day 2, December 19, 2024 (Thursday)**

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

**09:00-10:40 On/Off Session A-1: CSA**  
**(HALL A)**  
**(Chair: Yan LI)**

- 1. Purification Model for Malware Detection with GAN-based Multi-Teacher Distillation**  
*Seungyeon Baek, Jueun Jeon, Young-Sik Jeong*
- 2. Proactive Resource Management Scheme for High-performance Fog Computing**  
*Subin Jeong, Byeonghui Jeong, Young-Sik Jeong*
- 3. CVAE Real-time Anomaly Detection for Enhanced V2X Communication Security**  
*Yonas Teweldemedhin Gebrezgiher, Park Jong Hyuk*
- 4. DT-enabled Multi-view Federated Learning Intrusion Detection Framework for IIoT Networks**  
*Sekione Reward Jeremiah, Jong Hyuk Park*
- 5. Integrating Quantum Computing and AI for Enhanced Security in Industrial Internet of Things**  
*Heeji Park, Jong Hyuk Park*
- 6. XAI-Enabled TinyFL-CNN Architecture for Network Anomaly Detection in CCTV Environment**  
*Jimin Ha, Jong Hyuk Park*
- 7. A Survey on GenAI based Advanced Cyber Attacks on Smart Factory**  
*Byung Hyun Jo, Jong Hyuk Park*

**09:00-10:40 On/Off Session B-1: CAABE Workshop**  
**(HALL B)**  
**(Chair: Sheng Miao)**

- 1. Research on Traffic Classification Based on BiLSTM and Informer**

*Jiayu Liu, Daoquan Li, Zitong Liu*

**2. Prediction of Carbon Sources Dosing in Wastewater Treatment Plants Based on Deep Learning**

*Zuoqian Hu, Xiao Guo, Xiubo Chen, Chao Liu, Sheng Miao*

**3. Research on 3DPC construction method for structural high-performance component generation**

*Zhuang Zhuo, Xinyu Shi, Haining Zhou, Yuan Liang, Chengpeng Sun, Kang Bi*

**4. Innovative application of data-driven fault classification technology in bearing maintenance**

*Xiuyan Liu, Donglin He, Dongqing Guo, Tingting Guo*

**5. Decor: Distributed Transaction Optimization Based on Smart Construction**

*Fangning Yang, Cuihua Yang, Yongquan Zhang, Junqing Liang*

**6. Research Progress on Quality Control Method of Concrete 3D Printing Based on Computer Vision**

*Wenliang Liu, Dongsheng Ji, Weijiu Cui, Xinyu Shi, Chao Liu, Yaxin Tao*

**7. Lightweight Attention Residual Network (LAResnet) for EEG Emotion Recognition Research**

*Liyang Xia, Chenzhi Wang, Jiaqi Liu, Jie Sun*

**10:40-10:50 Coffee Break**

**10:50-12:30 Session A-2: BWW Workshop**

**(HALL A)**

**(Chair: Se Dong Min)**

**1. An Anonymous and Traceable Delegation Scheme for Decentralized Identifiers Using Aggregate Signatures**

*Taehoon Kim, Su-Hyun Kim, Im-Yeong Lee*

**2. A Study on Similarity Checks for Efficient OSS Identification**

*SeongCheol Yoon, Su-Hyun Kim, Im-Yeong Lee*

**3. Driver Personalization and Anti-Theft Mechanisms in In-Vehicle Networks**

*Kamronbek Yusupov, Jiung Hwang, Kyunghin Park, Baasantogtokh Duulga, Kangin Yim*

**4. Intelligent Waste Classification and Recycling Guidance Using U-Net: A Case Study on Asan City**

*Md Rezanur Islam, Yoseop Yoon, Yujin Kang, Jeong Minchan, Kangbin Yim*

**5. Music Session-Based Recommendation System Using LSTM With Attention Mechanism**

*Sophort Siet, Sony Peng, Sadriddinov Ilkhomjon, Misun Kang, Kyuwon Park, Doo-Soon Park*

**6. Dog Emotion Classification Using Transfer Learning and Shared Human-Dog FACS Features**

*Siheon No, Hyung Eun Kim, Chan Woo Park, Young Kim, Se Dong Min*

**10:50-12:30 On/Off Session B-2: CAABE Workshop**

**(HALL B)**

**(Chair: Sheng Miao)**

- 1. Study on the Design and Operation Strategy of Underground Wastewater Treatment Plant**  
*Xiubo Chen, Qidong Liang, Jing Xiao, Qingxia Hu, Xiangtai Bu, Sheng Miao, Zitong Liu*
- 2. A Novel Method to Quantitative Analyze Virtual Arts Based on Mixed Reality Technology**  
*Wenyu Dong, Yue Wang, Sheng Miao*
- 3. Integrating Digital Twin and Augmented Reality to enhance daily inspection for Wastewater Treatment Plant**  
*Guangze Kong, Haotian Sun, Huaying Sun, Chao Liu, Sheng Miao*
- 4. Robotic Arm Control with Mask R-CNN in Smart Manufacturing**  
*Kubra Kose, Nuri Alperen Kose, Xing Liu, Fan Liang*
- 5. Photovoltaic Technology in Practice in Rural Areas of Lin'an**  
*Xinyi Yang, Hualan Chen, Ziyi Zhou, Mengmeng Wang, Hanyue Xiang, Tianyi Wu, Jingwen Wang, Shiran Zi, Zhen Si, Yuanyuan Xiao, Meiyang Wang*
- 6. Simulation investigation on the local temperature regulation of data center using thermoelectric cooling integrated heat pipe**  
*Zhuoluo Pei, Hang Yu*
- 7. Building Energy Usage Prediction Using Physics-Based Modeling and Artificial Neural Networks**  
*Le Na Tran, Weijun Gao, Qian Wu, Gangwei Cai*

**12:10-13:30 Lunch**

**13:30-15:00 Local Arrangement Committee Meeting I**

**15:00-15:30 Coffee Break**

**15:30-17:00 Organizing Committee Meeting I**

### **Day 3, December 20, 2024 (Friday)**

**09:30-11:00 Local Arrangement Committee Meeting II**

**11:00-12:30 Organizing Committee Meeting II**

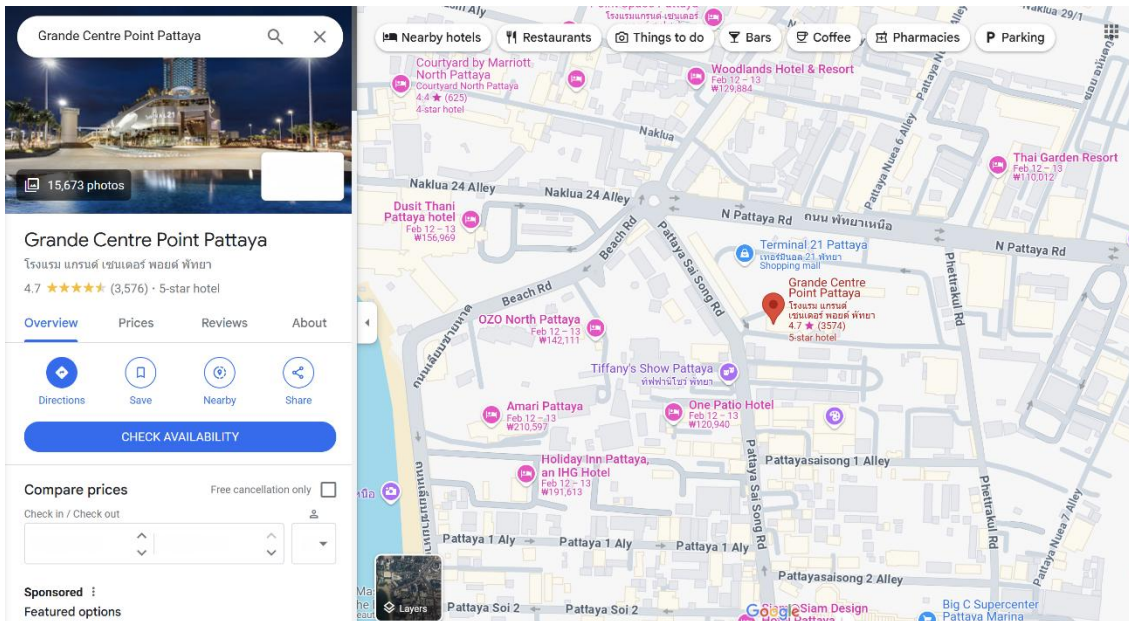
## Conference Venue

### Grande Centre Point Pattaya

- Grande Centre Point Pattaya
- 456 Moo.6 Na Kluea, Bang Lamung, Chonburi 20150, Thailand
- Hotel TEL +66 33 168 999 / FAX: +66 33 168 900
- Site: <https://www.grandecentrepointpattaya.com/>



### How to get into Grande Centre Point Pattaya?



- **Private Car**

- 1. **From Suvarnabhumi International Airport (BKK)**

- Approximately 1:30 hrs., 120 km: By the Bangkok – Chonburi – Pattaya Motorway (Highway No.7). Follow signs for Route 3/ Pattaya Nua. Turn right onto Route 3. Turn left onto Pattaya North road. Take Pattaya North road and Grande Centre Point Pattaya will be on the left.

- 2. **From Don Muang International Airport (DMK)**

- Approximately 2 hrs., 160 km: By Don Muang Toll Way. Take Sirat Expressway and Continue onto the Bangkok – Chonburi – Pattaya Motorway (Highway No.7). Follow signs for Route 3/ Pattaya Nua. Turn right onto Route 3. Turn left onto Pattaya North road. Take Pattaya North road and Grande Centre Point Pattaya will be on the left.

- 3. **From U-Tapao Pattaya International Airport (UTP)**

- Approximately 1 hrs., 50 km: Take the Highway 331. Continue onto Route 36. Continue onto Highway No.7 Follow signs for Route 3/ Pattaya Nua. Turn right onto Route 3. Turn left onto Pattaya North road. Take Pattaya North road and Grande Centre Point Pattaya will be on the left.

- **Bus**

- 1. **From Bangkok**

- Take the bus from Northern Bus Terminal (Morchit 2), Eastern Bus Terminal (Ekamai) and New Southern Bus Terminal (Sai Tai) to Pattaya Bus Terminal.

- 2. **From Pattaya Bus Terminal located at Pattaya North.**

- Head west through Pattaya North road about 20 minutes by walk (1.5 km) or 5 minutes by public transportation, Grande Centre Point Pattaya is on the left



## Banquet

### Grande Centre Point Pattaya

- Grande Centre Point Pattaya
- 456 Moo.6 Na Kluea, Bang Lamung, Chonburi 20150, Thailand
- Hotel TEL +66 33 168 999 / FAX: +66 33 168 900
- Site: <https://www.grandecentrepointpattaya.com/>





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

December 18-20, 2024  
Pattaya, Thailand

Organized by

**KCIA**