

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

December 17-20, 2025
Phu Quoc, Vietnam

Organized by

KCIA

Conferences

The 11th World Congress on Information Technology Applications and Services (World IT Congress 2026)

- February 11-13, 2026, Jeju, South Korea
- <http://www.worlditcongress.org2026/>

The 20th International Conference on Multimedia and Ubiquitous Engineering (MUE 2026)

- April 23-25 2026, Qingdao, China
- <http://www.mue-conference.org/2026/>

The 20th International Conference on Future Information Technology (FutureTech 2026)

- April 23-25 2026, Qingdao, China
- <http://www.futuretech-conference.org/2026/>

The International Conference on Big data, IoT, and Cloud computing (BIC 2026)

The 18th International Conference on Computer Science and its Applications (CSA 2026)

Message from the CSA 2025 General Chair

International Conference on Computer Science and its Applications (CSA 2025) is the 17th event of the series of international scientific conference. This conference takes place Phu Quoc, Vietnam, December 17 - 20, 2025. CSA 2025 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications. CSA 2025 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 2025 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2024(16th Edition: Pattaya, Thailand 2024), 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. 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. Alireza Souri, Prof. Le Anh Ngoc and Prof. Neil Yen. We would like to express special thanks to committee members for their timely unlimited support.

CSA 2025 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 Politécnica de Madrid Madrid, Spain

Message from the CSA 2025 Program Chairs

Welcome to the 16th International Conference on Computer Science and its Applications (CSA 2025) which will be held Phu Quoc, Vietnam, December 17 - 20, 2025. CSA 2025 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications.

CSA 2025 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 2025 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2024(16th Edition: Pattaya, Thailand 2024), 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. 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 2025 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 2025 Program Chairs

Ji Su Park, Jeonju University, Korea
Le Anh Ngoc, Swinburne University of Technology, Vietnam
Alireza Souri, Islamic Azad University, Iran
Neil Yen, University of Aizu, Japan

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Neil Y. Yen, The University of Aizu, Japan
Se Dong Min, Soonchunhyang University, Korea
Sheng Miao, Qingdao University of Technology, China

Invited Speaker 1



An Efficient Edge Computing Management Mechanism for Sustainable Smart Cities

Prof. Ngoc Le

Dean, Semiconductor & AI, Asia University, Vietnam
Director, Swinburne Innovation Space, Swinburne Vietnam
Director, Safe AI Foundation, Asia Pacific
Director, Korea Computer Industry Association
Director, International Association for Convergence Science & Technology

Abstract:

Since ancient times, humanity has envisioned a world where people and things connect and interact. The advent of generation mobile systems, the so-called 5 G in the early century, has realized this dream. 5 G can provide network services with extremely-high throughput and extremely-low delay and allows a huge device number to connect based on Internet infrastructure, forming the Internet of Things (IoT). In recent years, IoT has been applied in various fields serving humanity, such as smart cities, smart agriculture, healthcare, education, military, and IoT ecosystems. One of the main challenges of IoT applications is computing solutions to reduce service response times. This talk will introduce an efficient edge computing management mechanism for IoT applications in smart cities. Our mechanism proposes a small database (called an information map) that allows edge computing servers of smart cities to store edge service information. When the mobile end-users move to the new edge server' managed coverage, properties related to the EC service are exchanged between the edge servers. The experiment results have shown that our proposed mechanism improves service response time and energy consumption many times compared to the traditional mechanism. We hope that this mechanism will be strongly applied to sustainable smart cities in the future.

Biography:

Dr. Ngoc Le (Jimmy) holds a Ph.D. in Communication and Information Technology from Kyungpook National University (KNU), South Korea. He is currently the Director of Swinburne Innovation Space and an IT Professor at Swinburne University of Technology, Vietnam, where he leads the Intelligent Systems and Networks Research Group (ICISN). Additionally, he serves as the Dean of the Semiconductor Technology at Asia University Vietnam.

His areas of expertise include embedded and intelligent systems, communication networks, the Internet of Things (IoT), image and video processing, artificial intelligence (AI), and big data analysis. His professional activities encompass research, innovation management, training, and technology transfer.

Dr. Le is also the Director of the International Association for Convergence Science & Technology (IACST), Director of the Korea Computer Industry Association (KCIA), and Director of the SafeAI Foundation. He is actively involved in the global academic community as a keynote speaker, conference chair, founder of the Global Hackathon, and journal editor for IET Smart Cities and Human-centric Computing and Information Sciences (HCIS). Additionally, he serves as a technical

program committee member, session chair, book editor, and reviewer for numerous international conferences and journals.

Over the course of nearly 30 years, Dr. Le has gained extensive experience in both academia and industry. He has held several important positions, including Director of Development Programs at the Differentiated Automotive Platform (DAP) under FPT Global Automotive & Manufacturing, Vice-Dean of the Faculty of Electronics & Telecommunications at Electric Power University (EPU), and Head of the Communication Network Group at Vinh University's IT Department. Earlier in his career, he served as a researcher at the Telecommunications Networks Laboratory (TENET Lab) at Kyungpook National University in South Korea.

Outside of academia, Dr. Le contributes as a digital transformation and IT consultant, specialist, and mentor for organizations such as the Vietnam–Korea Businessmen and Investment Association (VKBIA), the Vietnam-Korea Experts and Intellectuals Association (VKEIA), and the Vietnam Innovation Network in Korea (VINK). He can be contacted via email at nle@swin.edu.au.

PROGRAM SCHEDULE FOR CSA 2025

| Day 1, December 17, 2025 | | |
|--------------------------|-----|---|
| Time | Min | HALL A |
| 17:30-20:30 | 150 | Welcome Reception (Only for Invited Members) |

| Day 2, December 18, 2025 | | | |
|--------------------------|-----|--|--|
| Time | Min | HALL A | HALL B |
| 09:30-10:00 | 30 | Registration | |
| 10:00-11:40 | 100 | Session A-1 CSA 2025 Chair: Min Choi | Session B-1 CSA 2025 Chair: Jaehwa Chung |
| 11:40-13:00 | 80 | Lunch | |
| 13:00-13:40 | 40 | Keynote Speech: Prof. Ngoc Le “An Efficient Edge Computing Management Mechanism for Sustainable Smart Cities” Chair: Yan Li | |
| 13:40-13:50 | 10 | Coffee Break | |
| 13:50-15:30 | 100 | Session A-2 CSA 2025 Chair: Phuong ANH Nguyen | Session B-2 CSA 2025 Chair: Abir EL Azzaoui |
| 15:30-15:40 | 10 | Coffee Break | |
| 15:40-17:20 | 100 | Session A-3 CSA 2025 Chair: Jin Gon Shon | Session B-3 CAABE Workshop Chair: Sheng Miao |
| 17:20-18:00 | 40 | Break | |
| 18:00-18:30 | 30 | Welcome Speech & Award | |

| | | |
|--------------------|----|---|
| 18:30-20:00 | 90 | Banquet (Only for Invited Members) |
|--------------------|----|---|

| Day 3, December 19, 2025 | | |
|---------------------------------|------------|---|
| Time | Min | HALL A |
| 08:40-09:00 | 20 | Registration |
| 09:00-10:40 | 100 | Session A-1 CSA 2025 Chair: Yan Li |
| 10:40-10:50 | 10 | Coffee Break |
| 10:50-12:30 | 100 | Session A-2 CAABE Workshop Chair: Sheng Miao |
| 12:30-13:30 | 60 | Lunch |
| 13:30-15:00 | 90 | Local Arrangement Committee Meeting I |
| 15:00-15:30 | 30 | Break |
| 15:30-17:00 | 90 | Organizing Committee Meeting I |

| Day 3, December 20, 2025 | | |
|---------------------------------|------------|---|
| Time | Min | HALL A |
| 09:30-11:00 | 90 | Organizing Committee Meeting II |
| 11:00-12:30 | 90 | Local Arrangement Committee Meeting II |

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 2025)

Day 1, December 17, 2025 (Wednesday)

Day 2, December 18, 2025 (Thursday)

Day 3, December 19, 2025 (Friday)

Day 3, December 20, 2025 (Saturday)

19:30-11:00 Local Arrangement Committee Meeting II

11:00-12:30 Organizing Committee Meeting II

Conference Venue

Seashells Phu Quoc Hotel

- Site: <https://www.seashellshotel.vn/ko/>
- Address: 01 Võ Thị Sáu, Dương Đông, Phú Quốc, Kiên Giang, 92500, Vietnam
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