

IEEE ISPCE-AS 2024, 25-27 October 2024, Wuhan Hubei, China



IEEE ISPCE-AS 2024

Programme

**IEEE International Symposium
on Product Compliance Engineering-Asia 2024**

October 25-27, 2024

Wuhan, China

<https://dl2link.com/ISPCE-AS2024/>

Co-Organised by **Wuhan University of Technology, Wuhan, China**
IEEE Product Safety Engineering Society

Sponsored by **IEEE Product Safety Engineering Society**
IEEE Consumer Technology Society
Asia-Pacific Association of Cognitive Intelligence



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A wide-angle photograph of a city skyline at sunset or dusk, with buildings illuminated by warm lights and the sky in shades of blue and orange. The water in the foreground is dark and calm.

01 Messages from IEEE ISPCE-AS 2024 Chairs

Dear Guests and Colleagues of the ISPCE-AS 2024,

ISPCE-AS 2024 will fully dedicate to the theme “Product Safety for Smart City”. Topics of ISPCE-AS 2024 cover (1) Emerging IoT technologies such as 5G, NB IoT, LoRa, Sigfox, RFID, NFC etc for safety applications e.g. landslides, IoT water, ...(2) Drones for building applications, healthcare, automobiles, road toll (3) artificial intelligence, robotics, stems, V2X, etc. (4) Mobile communication, transportation, energy efficiency (5) Public safety, critical communication (6) Internet of Things, Spectrum Policy (7) Inherently safer products and equipment (8) Product Safety services (9) Training and continuing education (10) Regulations and standards (11) Risk management (12) Workplace product safety (13) System and Software safety (14) Human factors, product compliance, smart sensors compliance. There will be Regular Sessions, Special Sessions, Tutorials and Visits. I am sure professionals and engineers may exchange ideas and learn from one another.

Please make yourself available for these three days of conference for informative scientific and technological presentations and discussions with professionals and colleagues.

The Organizing Committee (OC) does not only provide you the chance to enjoy an informative and stimulating atmosphere but also set up a first-class conference program. I want to make you aware that the City of Wuhan is wonderful and professional environments for smart city development and thus are excellent venues for professional exchange. The OC is thoughtful to include the authentic food, welcome reception and conference dinner into the registration fee.

I am confident that we will have an excellent time during these three days at ISPCE-AS 2024 and that at the end of the conference we will learn new knowledge and ideas. Please join us at ISPCE-AS 2024!.

Yours sincerely,

Prof. Haijun Zhang, Prof. Shengwu Xiong, and Prof. Kim-Fung Tsang

General Co-Chairs of ISPCE-AS 2024

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Organization of IEEE ISPCE-AS 2024

IEEE ISPCE-AS 2024 General Chairs:

Haijun Zhang, P.R.C
Shengwu Xiong, P.R.C
Kim-Fung Tsang, H.K.

IEEE ISPCE-AS 2024 Technical Program Chairs:

Bingyi Liu, P.R.C
Xinrong Hu, P.R.C
Bingo Wing-Kuen Ling, P.R.C.

IEEE ISPCE-AS 2024 Finance Chairs:

Y.H. Shum, H.K.
Jason Chan, H.K.
Jingjing Cao, P.R.C.
Tao Peng, P.R.C.
Tianyong Hao, P.R.C.

IEEE ISPCE-AS 2024 PSES President:

Mike Nicholls, US

IEEE ISPCE-AS 2024 PSES Past President:

Stefan Mozar, AU

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Organization of IEEE ISPCE-AS 2024

PSES VP Conference:

Bansi Patel, US

Publication Chairs:

Mingbo Zhao, P.R.C

Jingjing Cao, P.R.C

Enshu Wang, P.R.C

Kai Liu, P.R.C

SL Mak, H.K.

International Coordinators:

Flore Chiang , TW

Nancy Leveson, MIT

Claire Tsai, TW

Sinan Li, AU

Weizhi Meng, DEN

Cuili Yang, P.R.C

Zhou Wu, P.R.C

Conference Secretaries:

Jimmy CH Li , H.K.

Tony Chi-Chung Lee, H.K.

Liaison:

WC Lee, H.K.

Alick Mak, H.K.

Eddie Liu, H.K.

Logistics:

George Chan

Webmasters:

Fanny WF Tang, HK

Jiaheng Wu, P.R.C

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Organization of IEEE ISPC-E-AS 2024

Technical Tracks:

Track 1: Artificial intelligence based optimization and control in industrial process

Qiang Jia (Jiangsu University)

Cuili Yang (Beijing University of Technology)

Xiaowen Bi (City University of Hong Kong)

Track 2: AI-driven Cybersecurity Engineering and its Applications

Weizhi Meng, Technical University of Denmark, Denmark

Yu Wang, Guangzhou University, China

Chengqing Li, Xiangtan University, China

Track 3: AI-driven System Security, Safety, and Reliability

Zhigao Zheng, Wuhan University

Shahid Mumtaz, Nottingham Trent University

Cheng Dai, Sichuan University

Track 4: Advances in AI-driven Complex Systems and its Consumer and Industrial Applications

Jingjing Cao, Wuhan University of Technology, China

Xin Su, Hohai University, China

Choujun Zhan, South China Normal University, China

Track 5: Edge Intelligence and Its Applications to Consumer Electronics

Penglin Dai, Southwest Jiaotong University

Hao Zhang, Chongqing University of Posts and Telecommunications

Track 6: Artificial Intelligence in Abnormal Detection, Fault Diagnosis and Prognostic Management

Huiming Jiang, University of Shanghai for Science and Technology

Jing Yuan, University of Shanghai for Science and Technology

Yu Wang, Xi'an Jiaotong University

Track 7: Large Language Models and Multimodal Fusion in Human Activity Recognition

Xiao Zhang, South-Central Minzu University

Yu Zhou, Shenzhen University

Hangjun Che, Southwest University

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Programme Overview

Tentative Rundown on 26 October 2024 (Saturday)

Time	Event	Duration
9:00-9:20	Opening and Welcome Speech	20mins
9:20-9:30	Conference Introduction	10mins
9:30-9:40	Group Photo	10mins
9:40-10:25	Keynote speech 1: AI for Understanding Remote Sensing Imagery – By Prof. Guisong Xia, Wuhan University, China	45mins
10:25-10:30	Q&A of Keynote speech 1	5mins
10:30-10:50	Coffee Break	20mins
10:50-11:35	Keynote speech 2: Research on Generative Image Steganography for Covert communication – By Prof. Zhili Zhou, Guangzhou University, China	45mins
11:35-11:40	Q&A of Keynote speech 2	5mins
12:00-13:30	Lunch Break	
13:30-15:20	Standards Forum	110mins
15:30-17:30	Session 1: PPT Report	15mins per author
15:30-17:30	Session 2: PPT Report	15mins per author
18:30-20:30	Dinner Time and Reward Session	120mins
END		

03 Programme Overview

Tentative Rundown on 27 October 2024 (Sunday)

Time	Event	Duration
9:00-9:45	Keynote speech 1: UAV-Assisted Intelligent Power Grid Inspection: Challenges and Techniques – By Prof. Feng Lyu, Central South University, China	45mins
9:45-9:50	Q&A of Keynote speech 1	5mins
9:50-10:35	Keynote speech 2: Root Cause Analysis by Industrial Alarm & Event Data Analytics – By Prof. Wenkai Hu, China University of Geosciences, China	45mins
10:35-10:40	Q&A of Keynote speech 2	5mins
10:40-10:55	Coffee Break	15mins
10:55-11:40	Keynote speech 3: AI Based Optimal Operation of Power Systems with Renewable Energy – By Prof. Jizhong Zhu, South China University of Technology, China	45mins
11:40-11:45	Q&A of Keynote speech 3	5mins
11:45-13:30	Lunch Break	
13:30-16:30	Session 1: PPT Report	15mins per author
13:30-16:30	Session 2: PPT Report	15mins per author
17:00-17:30	Closing Ceremony	30mins
END		

04 Programme in Detail



Opening

Date & Time: October 26th (Saturday), 9:00-11:40

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Host: Prof. Haijun Zhang

1. **Opening Speech from General Chair of IEEE ISPCE-AS 2024: Kim-Fung Tsang, City University of Hong Kong**
2. **Welcome Speech from IEEE PSES: Bansi Patel**
3. **Opening Speech from Department of Computer Science and Artificial Intelligence, Wuhan University of Technology: Bing Shi**
4. **Conference Introduction from Technical Program Chair: Mingbo Zhao**



Keynote Speech

Host: Prof. Haijun Zhang

5. Keynote speech: AI for Understanding Remote Sensing Imagery

By Prof. Guisong Xia, Wuhan University, China

Time: 9:40-10:30

6. Keynote speech: Research on Generative Image Steganography for Covert communication

By Prof. Zhili Zhou, Guangzhou University, China

Time: 10:50-11:40



Session 1

Date & Time: October 26th (Saturday), 15:30-17:30

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Chair: Qiang Jia, Bingo Wing-Kuen Ling

1. **(15:30-15:45) GarmentFolding: Learning Efficient Garment Folding Based on Lift & Drag Dynamic Action**
Ruhan He, Jie Lu and Lianqing Yu
2. **(15:45-16:00) Privacy Preserving Prescribed-Time Formation Algorithm of Multi-UAV Systems With Event-Based Design**
Qiang Jia and Shihan Lu
3. **(16:00-16:15) Task Offloading and Resource Allocation for ICVs in CFNs via Constrained MARL**
Enshu Wang, Jinbo He, Bingyi Liu, Haiyong Shi, Weizhen Han and Libing Wu
4. **(16:15-16:30) Exploring How Urban Morphology Influences Building Thermal and Environmental Performance Alongside Renewable Energy Utilization**
Chi Chung Lee, Elena Bian, S. L. Mak and C. Y. Li
5. **(16:30-16:45) Interpretable Semantic-aware Unsupervised Segmentation of Skin Lesions**
Lexuan Cao, Yukai Shi, Zhijing Yang, Bingo Wing-Kuen Ling and Yongyi Lu
6. **(16:45-17:00) Abnormal Vibration Detection by 2D Digital Image Correlation Analysis**
Yuan Heng Sun, Hao-Chun Yue, Yan-Ann Chen, Cheng-Kuan Lin and Yu-Chee Tseng
7. **(17:00-17:15) Legal Judgement Prediction Via Contrastive Learning Based-retrieval And Semantic Embedding**
Chaoyu Wei, Qixuan Zhang, Juan Xu, Yanling Wang, Zhenhua Huang and Tianyong Hao
8. **(17:15-17:30) Two-Stage Compliance Detection for Power Enterprises Based on NLI and LLM**
Min Hua, Qi Zhao, Jiale Song and Xue-Song Tang

Session 2

Date & Time: October 26th (Saturday), 15:30-17:30

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Chair: Cuili Yang, Ye Wang

1. (15:30-15:45) **VariSize: A Dataset and Model for 3D Garment Automatic Grading and Editing Based on Latent Space**
Tao Peng, Yingying Wang, Li Li, Jinlong Qin, Junping Liu and Xinrong Hu
2. (15:45-16:00) **Application of Air Quality Monitoring for 3D Printing Process**
Shu Lun Mak, Wai Ying Chak and Fanny Tang
3. (16:00-16:15) **Self-organizing Recurrent Fuzzy Neural Network for Nonlinear System Modeling**
Zhili Geng, Wei Liu and Cuili Yang
4. (16:15-16:30) **Optimizing Renewable Energy Heating: An Integration of TRNSYS Simulation of Solar and Ground Heat Exchange Systems**
Wenshuo Zhang, Chi Chung Lee, Linrui Jia, Junyou Ma, Ruijia Liu, Jie Han and Ping Cui
5. (16:30-16:45) **Optimal Multi-channel Denial-of-Service Attack in the Consensus of Multi-Agent Systems**
Penghai Jie and Jing Zhu
6. (16:45-17:00) **Wind turbine gearbox temperature prediction based on the DSCNN-BiLSTM model**
Shi Kai-di, Dong De-Zhi, Yao Guo-Qiang, Yuan Shi-Neng, Chen Xiu-Gao, Zhang Guang-Ming, Sun Hao, Song Yu-Jia and Sun Xiao-Yan
7. (17:00-17:15) **Classification of EEGs via Multi-layer Wavelet Transform and Feature Fusion to Enhance Depression Screening**
Yiru Liang, Bingo Wing-Kuen Ling and Dingkai Liang
8. (17:15-17:30) **Vertical Displacement of Slab End Detection and Quantification based on Multidimensional Information Fusion of Point Cloud**
Yu Wang, Xd Gan, Hongtuo Qi, Wenchen Shan, Jin Zhou and Zhou Wu

Keynote Speech

Date & Time: October 27th (Sunday), 9:00-11:45

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Host: Prof. Zhou Wu

1. Keynote speech: UAV-Assisted Intelligent Power Grid Inspection: Challenges and Techniques

Prof. Feng Lyu, Central South University, China

Time: 9:00-9:50

2. Keynote speech: Root Cause Analysis by Industrial Alarm & Event Data Analytics

By Prof. Wenkai Hu, China University of Geosciences, China

Time: 9:50-10:40

3. Keynote speech: AI Based Optimal Operation of Power Systems with Renewable Energy

Prof. Jizhong Zhu, South China University of Technology, China

Time: 10:55-11:45

Session 1

Date & Time: October 27th (Sunday), 13:30-16:30

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Chair: Jingjing Cao

1. **(13:30-13:45) WIFI Behavior recognition model design based on CNN and LSTM**
Haiwen Chen
2. **(13:45-14:00) A Study on Toy Age Grading Methods: A Comparative Study of Large Language Models and Machine Learning Approaches**
Shui Lun Au, Shu Lun Mak and Fanny Tang
3. **(14:00-14:15) DBCERT: Reconstruct the BERT model for Chinese spelling correction**
Rongpeng Li, Xiaohong Xiang, Bo Hu, Xin Deng and Jun Zhao
4. **(14:15-14:30) Research on Surface Defect Detection of Aluminium Based on Improved Faster RCNN**
Hui Ting Li, Wen Jie Liao, Jia He Huang and Hong Jin Zhu
5. **(14:30-14:45) Industrial Process Soft Sensing Based on Nonlinear Sparse Generalized Method of Moments Estimation Model and Relevance Vector Regression**
He Li, Zhaojing Wang, Xinrong Hu, Xiaoli Ruan, Fei Yang and Xiaoyun Yan
6. **(14:45-15:00) Spatio-Temporal Feature Attention Fusion for Fault Detection in Complex Industrial Processes**
Biao Zhu, Zhaojing Wang, Li Li, Xiaoyun Yan, Xinrong Hu and Lijun Li
7. **(15:00-15:15) Joint Task Offloading and Resource Allocation in Software-Defined Networking-Enabled Vehicular Edge Computing: A Multi-Objective Approach**
Ke Xiao, Zhixin Mei, Aofei Dong and Kuiyuan Feng
8. **(15:15-15:30) A Method for Target Locking in Combat Process Based on the Enhanced YOLOv8**
Xiaolong Wang, Zhennan Wang, Hao Tian, Zhiwen Jiang, Jingjing Cao and Qiangwei Zhao

9. **(15:30-15:45) Application of the MOD-STL-Louvain Method for Community Detection in Manufacturing Industries: A Study on Electricity Consumption**
Zhiqiang Lan, Guoyao Wu, Yongjie Guo, Fan Pan, Yingxin Shen, Jiacheng Wu, Yanan Yu, Yuan He and Yujun Yan
10. **(15:45-16:00) Time-Series Adjusted FasterPAM Clustering of Enterprise Electricity Consumption Based on Autocorrelation Function**
Guoyao Wu, Zhiqiang Lan, Kun Zhou, Xiaoying Huang, Qiyu Wu, Xiao Lin, Linling Mao and Qiuwen Wang
11. **(16:00-16:15) Analysis and Application of Retail Commodity Consumption Situation**
Chao Deng, Jinyu Zhang, Xipeng Liu, Na Li, Yuhua Mo and Meng Liu
12. **(16:15-16:30) MSED OA: Enhancing DOA Estimation with Multiscale Squeeze-and-Excitation Networks for Automotive Millimeter-Wave Radar**
Hu Tingkai, Sun Shuang, Wu Zhenyu, Li Chuandong, Xiong Hailing and Luo Zhen

Session 2

Date & Time: October 27th (Sunday), 13:30-16:30

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Chair: Kai Yang

1. **(13:30-13:45) A Lightweight Algorithm for Detecting Steel Defects in Small Samples:RBSI-YOLOv8nv**
Wenjie Liao, Huiting Li, Jiahe Huang and Hongjin Zhu
2. **(13:45-14:00) Bi-GRUI and Transformer Variant Based Missing Value Imputation Method for Electricity Consumption Data**
Peng Wang, Honglin Chen, Xi Chen, Lin Li, Tao Qiu and Yi Lu
3. **(14:00-14:15) Adaptive Control for Nitrate Nitrogen With Time Delays Based on Recurrent Fuzzy Neural Network**
Haixu Zhu, Yan Zheng and Cuili Yang
4. **(14:15-14:30) Recurrent Omnidirectional Stereo Matching Method Based on Mixture of Laplace Loss**
Jinlin Li, Zhonghua Wang, Weijie Huang and Chongxin Liu
5. **(14:30-14:45) Cooperative Scheduling and Hierarchical Memory Models for Multi-Agent Systems**
Huhai Zou, Rongzhen Li and Tianhao Sun
6. **(14:45-15:00) DNN-Based Task Partitioning and Offloading with Reliability Guarantees in Multi-UAV-Assisted MEC System**
Ling Wang, Junhua Wang and Dai Chen
7. **(15:00-15:15) Nonlinear system modeling based on wavelet neural networks**
Hanchang Huang and Guo Luo
8. **(15:15-15:30) Classification of cognitive activities EEGs via Singular Spectrum Analysis and Joint Approximate Diagonalization of Eigen-matrices algorithm with ensemble classifier**
Xiangyu Luo and Bingo Wing-Kuen Ling

9. [\(15:30-15:45\)](#) **Classification of motion imagination via multivariate variational mode decomposition and Second-Order Blind Identification using multi-channel data**
Jibo Li and Bingo Wing-Kuen Ling
10. [\(15:45-16:00\)](#) **Classification of Cognitive EEGs via Attention-based Multi-Scale Dilated Convolution Network**
Yingfeng Ouyang, Bingo Wing-Kuen Ling and Weizhi Guo
11. [\(16:00-16:15\)](#) **Enhancing Driver Decision-Making Through Head-Up Display: A Study on Information Sensitivity and Visualization Methods**
Bangxu Tian, Bingxuan Guo, Shengtian Huang and Dongyao Jia



Closing Ceremony

Time: October 27th (Sunday), 17:00-17:30

Venue: 269 Checheng Avenue, Wuhan Economic and Technological Development Zone, Caidian District, Wuhan, 430056

Summary Speech from Prof. Bingyi Liu, PC Co-Chair of IEEE ISPCE-AS 2024



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Thank You!



Thank you for attending the IEEE ISPCE-AS 2024!

