



The 2nd International Symposium on Urban Lifeline

Saitama, Japan 7.18~20, 2025.

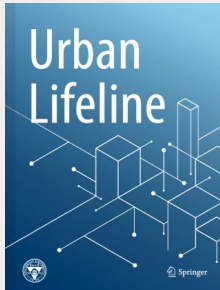
WELCOME

Welcome to the International Symposium on Urban Lifeline ISUL 2025.

This international symposium was hosted by the international open access journal Urban Lifeline published by Springer to connect the researchers and experts of sustainable and smart construction and maintenance of urban lifelines. The first ISUL was hosted by Southeast University in Nanjing, China 2024. With the success of the first one, the second ISUL was decided to be hosted by Saitama University (the venue was changed to The Mark Grand Hotel - please refer to General Information Page) in Saitama Japan from July 18-20, 2025. This symposium will be continued to welcome experts, visionaries, and thought leaders from around the world to share state of art knowledge, findings, and ideas. This symposium provides a unique platform for renowned researchers and thought leaders to explore the multifaceted dimensions of urban lifelines, with a specific focus on sustainability, safety, resilience, and intelligence. By fostering collaboration, we aim to advance our collective understanding of this essential field. As we embark on this exciting journey, we invite you to be a part of this remarkable endeavor. Join us in Saitama as we work together to shape the future of urban lifelines, fostering sustainability, enhancing safety, building resilience, and harnessing the power of intelligence in our urban environments.

The symposium will focus on the safety, resilience, intelligence, and sustainable development of urban lifelines, with topics including but not limited to:

- Safety and resilience of urban lifelines
- Smart and intelligent infrastructures
- Artificial intelligence and urban lifelines
- Sustainable construction for low-carbon developments
- Operation and maintenance of urban lifelines
- Urban social and technical systems



Hosted by:
Urban Lifeline



Co-organized by:
Local Organization Committee
Saitama University
Southeast University



Local organizing committee

Ji Dang (Saitama University)
Celimuge Wu (The University of Electro-Communications)
Yao Luan (Saitama University)
Chandra S Goit (Saitama University)
Atsushi Sugama (Saitama University)
Xin Wang (Ashikaga University)
Kai Xue (The University of Tokyo)
Boyu Zhao (The University of Tokyo)
Xinhao He (Tohoku University)
Jie Shen (Saitama University)



Sponsors

Special Thanks for our Sponsors:

- SmartCity Research Institute Co.Ltd
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Venue

- **Address:** 3-2 Shintoshin, Chuo-ku, Saitama-shi, Saitama 330-0081 JAPAN
- **Telephone:** +81 48-601-1111
- **Access:** <https://themarkgrand.com/en/access/>



Rooms

Room1 : **SAKURA HALL 1 (3F)**



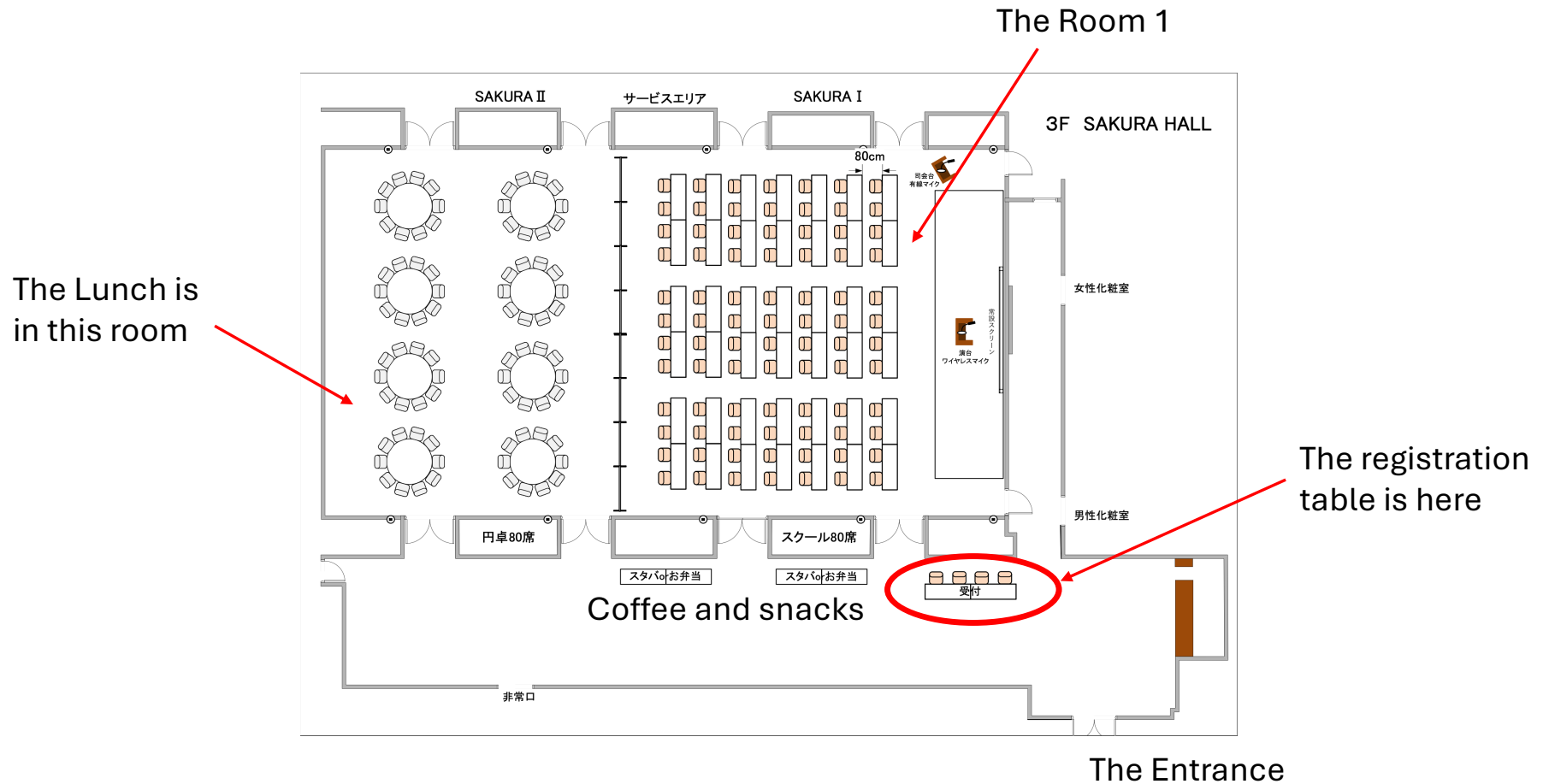
This is our main room Keynotes, Opening and Close Ceremony will be here.

Room2 : **MEETING ROOM (5F)**

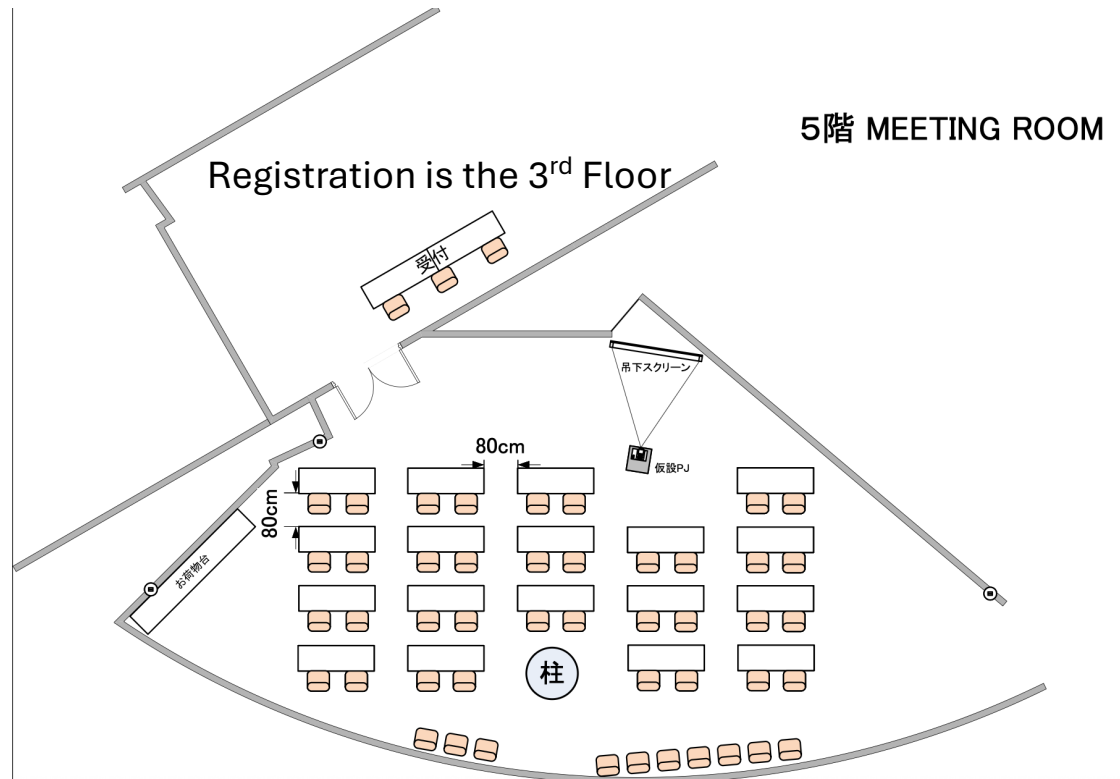


This is second room with great view.

Registration Table is near to room 1



Room 2 MEETING ROOM



Reception Party

Name tags will be distributed here too.

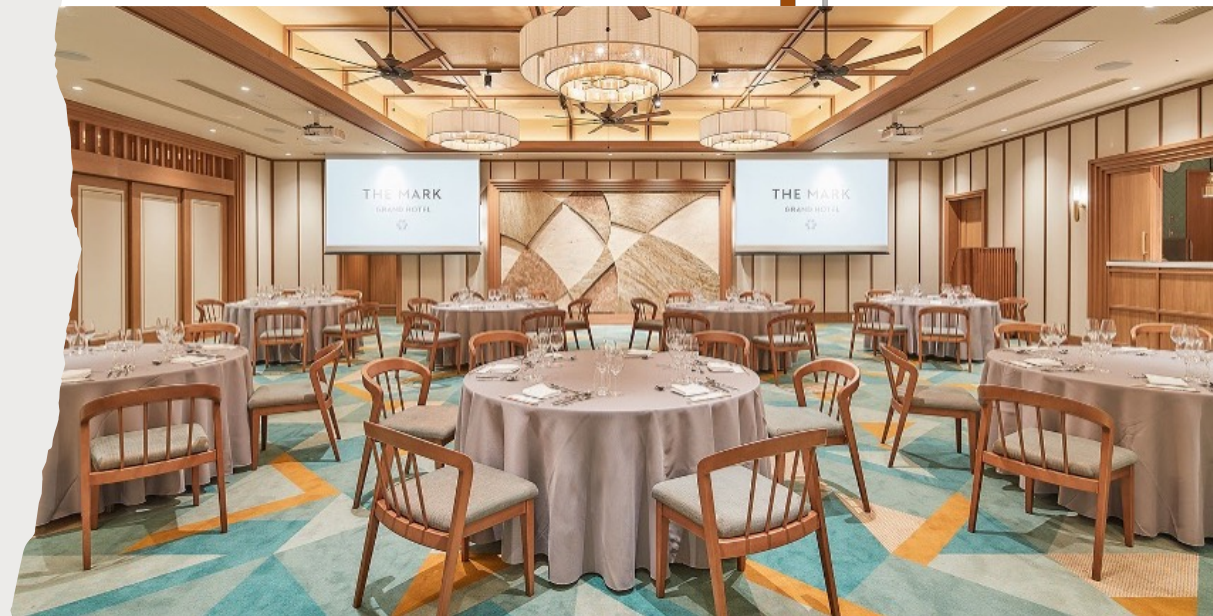
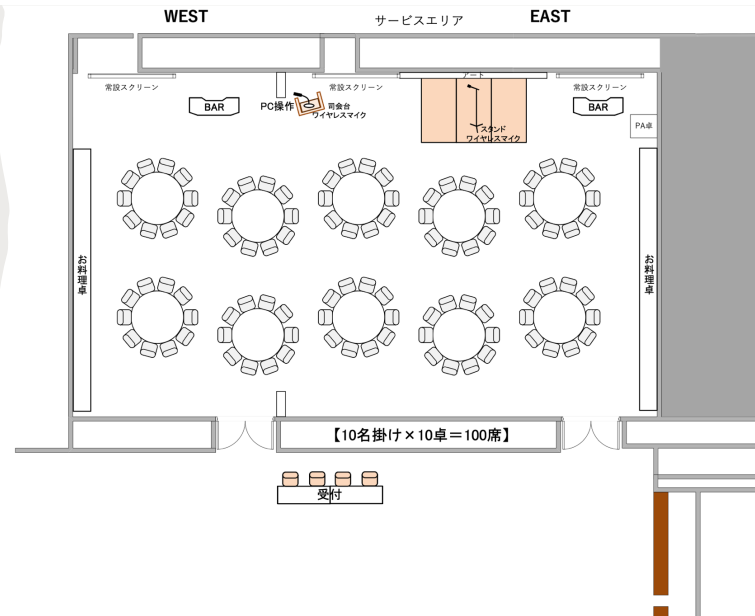
For your convenient stationary bags will be available 7/19 am.

- Time: 7/18 18:00~20:00
- Address: 2-4-24 Kamikizaki, Urawa-ku, Saitama-shi, Saitama 330-0071, Japan
- Access: <https://villasdesmariages.com/location/saitama/>



Banquet

- Room: The Mark Room (5th Floor)
- Time: 7/19 18:00~20:00
- Access: <https://themarkgrand.com/en/access/>





Presentation Styles

- All authors are asked to do an Oral Presentation with PPT.
- You can use USB flash memory to copy your file to our computer during the coffee break or use your own laptop.
- The connection from PC to the projector is HMDI but we will also prepare USB-C type convertors.
- Times:
 - Presentation time is 7 minutes
 - Q&A time is 3 minutes
 - Total time for each presenter is 10 minutes.
- Generally, the first author is the presenter, or it will be marked be under bar

Program-at-a-glance

2025/7/18 Friday		2025/7/19 Saturday		2025/7/20 Sunday		
Villa De Marriage	Time	SAKURA HALL I (3F)	Meeting Room (5F)	Time	SAKURA HALL I (3F)	Meeting Room (5F)
	9:00	Opening Ceremony		9:00	GS03	SS08
	9:10	Keynote 1 Prof. Pang-jo Chun		9:50	Coffee Break	
	10:00	Keynote 2 Prof.Tomonori Nagayama		10:00	SS09	SS08 GS01
	10:50	Coffee Break				
	11:00	Keynote 3 Prof. Sadish Rehan				
	11:50	Group Photo		11:00	Close Ceremony	
	12:00	Lunch Time				
	13:00	SS01 SS05	GS01			
	13:50	Coffee Break				
	14:00	SS05	GS01 SS02			
14:50	Coffee Break					
Registration Desk open 17:30	15:00	SS05 SS06	SS03			
	15:50	Coffee Break				
	16:00	SS06	SS04 SS07			
	16:50	Coffee Break				
	17:00	SS06 GS02	SS07			
Welcome Reception 18:00	18:30	Banquet Dinner				
Location: Villa De Marriage		Location: The Mark Grand Hotel				

2025/7/18Friday			
Start Time	Finish Time		
17:30		Location:	Registration Desk Open
18:00	20:00	Villa De Marriage	Welcome Reception

2025/7/19 Saturday				
Start Time	Finish Time	SAKURA HALL I (3F)	Title	Speaker
8:30		Registration Desk (Entrance to SAKURA HALL 1)		
9:00	9:10	Opening Ceremony	Opening Address	Prof. Chee-Kiong Soh, Chief Editor of Urban Lifeline, Southeast University
9:10	10:00	Keynote 1	The Next Generation of Infrastructure Maintenance	Prof. Pang-jo Chun, The University of Tokyo
10:00	10:50	Keynote 2	Advanced Infrastructure Monitoring: Leveraging Simulation, IoT, and Machine Learning Toward Resilient Society	Prof.Tomonori Nagayama, The University of Tokyo
10:50	11:00	Coffee Break		
11:00	11:50	Keynote 3	Balancing Indoor Environment and Operational Strategies in Aquatic Centers: Trade-Offs Through the Water-Health-Energy Nexus Abstract	Prof. Rehan Sadiq, Provost & Vice-president Academic of University of British Columbia Okanagan
11:50	12:00	Group Photo		
12:00	13:00	SAKURA HALL 2 (3F)	Lunch	Lunch Box

2025/7/19 Saturday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
13:00	13:50	SS01	Gas Explosion Assessment and Safety in Urban Environment	Zhi Li
		Paper ID	Paper	Presenter and authors
		SS01_01	Research on Natural Gas Pipeline Leak Source Localization Based on Particle Swarm Optimization Method and Bayesian Inference in underground utility tunnels environment	Xi Zeng, Li Chen
		SS01_02	A Graph Neural Network Method for Gas Leakage Diffusion Prediction and Explosion Risk Assessment	Shaokun Guan, Li Chen
		SS01_04	Assessment of Explosion Risks and the Effectiveness of Multiple Safety Barriers in Coupled Gas-Electric Lifeline Systems in Underground Utility Tunnels	Sen Deng
		SS01_05	Probabilistic Framework to Evaluate the Failure of Offshore Pipeline Using Bayesian Inference and Copula Theory	Zhi Li, Xiaoguang Zhou, Yanbo Niu, Chunbao Xiong
13:40	13:50	SS05	Seismic Performance Evaluation of Pipelines and Network Systems	Zilan Zhong
		SS05_01	Mechanical response and fragility analysis of bell-spigot jointed pipelines crossing faults considering multi-parameter randomness	Lingyue Xu; <u>Zilan Zhong</u> ; Xin Zhao; Yabo Zhang; Jie Liu
13:50	14:00	Coffee Break		
2025/7/19 Saturday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
14:00	14:50	SS05	Seismic Performance Evaluation of Pipelines and Network Systems	Zilan Zhong
		Paper ID	Paper Title	Presenter and authors
		SS05_03	Experimental evaluation of the seismic performance of newly assembled RCS mortise and tenon joints	Chenglong Wu, Conglin Ma, Ruizhe Sun, Ben Mou
		SS05_04	Seismic reliability analysis of in-service water distribution networks based on probability density evolution method	Wei Liu; Zhiyin Xie
		SS05_05	Application of complex-valued Morse wavelets to generate spectrum and energy-compatible (SEC) bi-directional ground motions	Jian Zhou, Jian-Ting Zhou, Yi-Long Cao, Akira Igarashi
		SS05_07	Seismic reliability assessment of urban water supply networks	Huiquan Miao
		SS05_08	Time-Varying Seismic Fragility Analysis of Buried Corroded Steel Pipelines Under Pulse-Like Ground Motions	Junyan Han, Xiaoqiang Wang, Liyun Li, Jiaxue Wang, Chengshun Xu, Xiuli Du
14:50	15:00	Coffee Break		

2025/7/19 Saturday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
15:00	15:20	SS05	Seismic Performance Evaluation of Pipelines and Network Systems	Zilan Zhong
		Paper ID	Paper Title	Presenter and authors
		SS05_09	Seismic failure mechanism of underground shaft with layered rock soil strata	Bu Zhang, Zilan Zhong, Xiuli Du
		SS05_10	Probabilistic Assessment of Various Ground-Motion Intensity Measures in Seismic Hazard Analysis	Haizhong Zhang, Yan-Gang Zhao, Rui Zhang
15:20	15:50	SS06	Mitigation and Protection Measures for Urban Lifeline Systems against Natural Disasters	Yoshihisa Maruyama
		Paper ID	Paper Title	Presenter and atuhors
		SS06_01	Methodology for Object-Level Change Detection in Post-Earthquake Building and Urban Lifeline Damage Assessment Based on Remote Sensing Images: OCD-BDA and OCD-ULA	Gu JianCheng; Xie ZhengTao; He XinHao
		SS06_02	Critical displacement of expansion joints for ground deformation damage of water pipe bridges during the earthquake	Yuya Nishi, Yuki Kanamaru, Dai Matsumoto, Takeshi Koike, Yasuko Kuwata
		SS06_03	Sediment Uplift in the Water Tank Caused by Sloshing	Yasuko Kuwata, Kanoko Yamashita, Nozomu Yoneyama, Kunio Yasui
15:50	16:00	Coffee Break		
2025/7/19 Saturday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
16:00	16:50	SS06	Mitigation and Protection Measures for Urban Lifeline Systems against Natural Disasters	Yasuko Kuwata
		Paper ID	Paper Title	Presenter and authors
		SS06_04	Theory and method for state evaluation of general highway bridges with minimal sensor placement	Hiroto Yamada, Xinhao He, Shigeki Unjoh
		SS06_05	Evaluation of Water Distribution Pipeline Damage in Niigata City Following the 2024 Noto Peninsula Earthquake	Yoshihisa Maruyama, Masaki Suwa, Wen Liu
		SS06_06	Seismic energy distribution and fragility assessment of reinforced concrete multi-span highway bridges	Muhammad RashidMuhammad Rashid, Mayuko Nishio
		SS06_07	Seismic damage estimation to sewerage facilities in Lima, Peru for an anticipated mega-earthquake scenario	Gaku Shoji, <u>Yuki Kominami</u> , Yoshihisa Maruyama
		SS06_08	Survey of bridge damage caused by the Noto Peninsula earthquake and the possibility of using UAVs during disasters	Chisato Mizuno, Xin Wang, Ji Dang
16:50	17:00	Coffee Break		

2025/7/19 Saturday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
17:00	17:30	SS06	Mitigation and Protection Measures for Urban Lifeline Systems against Natural Disasters	Gaku Shoji
		Paper ID	Paper Title	Presenter and authors
		SS06_09	Experimental Study on Silicone Elastomeric Bearings for Seismic Isolation in Urban Infrastructure	Arthur RAMANDALINA, Ji DANG
		SS06_10	Artificial intelligence and digital twin powered risk prediction for urban lifeline infrastructures	Hanwei Zhao, Xiaonan Zhang, Youliang Ding, Tong Guo
		SS06_11	Structural performance of ultra high voltage transmission lines under multi-hazard action of earthquake and icing	Jun Gong
17:30	17:50	GS02 1~2	Safety and resilience of urban lifelines	Yuchuan Tang
		Paper ID	Paper Title	Presenter and atuhors
		GS02_01	Integrating Multiple Infrastructure Systems for Regional Seismic Resilience Evaluation Through Urban Mobility Simulation	Yuchuan Tang, Tongqing Wang, Changpeng Cai
		GS02_04	A camera extrinsic calibration method for the shape measurement of underwater bridge piers	Tao Wu, Shitong Hou, Han Shen, Zhishen Wu, Wen Xiong
2025/7/19 Saturday				
Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
13:00	13:50	GS01	Smart and intelligent infrastructures	Shitong Hou
		Paper ID	Paper Title	Presenter and authors
		GS01_02	Urban Transit impacts on land uses and development over time, The Case Study of Orange Train in Lahore, Pakistan	Haroon Gulzar, Hamna Abid
		GS01_04	Transfer learning approach to population-based SHM for bridge structures	Dan Li, Jiajun Zhou, Jian Zhang
		GS01_06	Spatio-Temporal Distribution of Vehicles on Highway Bridges Based on Computer Vision and Camera Tracking	Yinjia Shu;Ruiyang Zhang;Rong Ling;
		GS01_07	Shear-NN: neural network-based shear constitutive modeling of beam-column joints in finite element analysis	Shunyao Wang; Shan He; Ruiyang Zhang
		GS01_08	Domain-Oriented Evaluation Framework for Semantic Segmentation in Underwater Surface Defect Identification of Bridges	Han Shen; Shitong Hou; Yuxuan Wang
13:50	14:00	Coffee Break		

2025/7/19 Saturday				
Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
14:00	14:10	GS01	Smart and intelligent infrastructures	Dan Li
		Paper ID	Paper Title	Presenter and authors
		GS01_09	Machine Vision for Civil Engineering Applications	Zheng Liu, Kasun Hewage, Rehan Sadiq
14:10	14:40	SS02	Advancing Intelligent Road Infrastructure Maintenance and Traffic Management	Xiangdong An
		Paper ID	Paper Title	Presenter and atuhors
		SS02_03	Evaluating the Characteristics of Mixed Traffic Flow under the Intelligent Connected Environment Based on Autonomous Driving Dataset	Ying Hu, Xiaonian Shan, Changxin Wan
		SS02_05	Neural Network-Based Method for Analyzing Regional Heterogeneity in Road Pavement Deterioration	Kenshin Kuwahara, Atsushi Sugama, Yuto Nakazato
		SS02_06	Real-Time Data Mending Method with TimeGAN for Structural Health Monitoring of Large Bridges	Liangliang Hu, Xiaolin Meng, Jiawei Xiong, Xiangdong An, Yilin Xie
14:50	15:00	Coffee Break		
2025/7/19 Saturday				
Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
15:00	15:50	SS03	Advances in Innovative Materials and AI-driven Design of Structures and Infrastructures	Yilong Cao
		Paper ID	Paper Title	Presenter and authors
		SS03_01	A data-centric framework for efficient road pothole annotation : for In-vehicle smartphones images under complex scenes	Xue Chunliang, Xue Kai,Tomonori Nagayama
		SS03_02	Micromechanical Analysis and Performance-driven Optimization of Textile Reinforced Engineered Cementitious Composite (TR-ECC)	Peiyun She, Shuhang Ye, Yiming Yao , Deju Zhu, Cong Lu
		SS03_06	Intelligent Prediction of Shear Strength Parameters of Zhoushan Soft Soils Using Probabilistic Analysis and XGBoost	Qiaoman Chen, Haihua Zhang, Jinbo Xie, Xianfeng Ma, Jiangu Qian
		SS03_07	Effect of vehicle-induced vibration on the strength, nano-mechanical properties, and microstructural characteristics of ultra-high-performance concrete during hardening process	Jingchen Leng, Jun Yang, Zhongya Zhang, Jiang Du, Yang Zou, Jianting Zhou
		SS03_08	Flexural performance of damaged RC beams strengthened with UHPC: Coupling effect of load-induced cracking and chloride corrosion	Rui Chen, Jianting Zhou, Jun Yang, Yang Zou, Zhongya Zhang
15:50	16:00	Coffee Break		

2025/7/19 Saturday				
Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
16:00	16:30	SS04	Mapping and Monitoring Urban Lifelines: The Role of Geospatial and Geomatics Technologies	Craig Hancock
		Paper ID	Paper Title	Presenter and authors
		SS04_03	Shield tunnel misalignment detection based on facility point cloud removal and segment segmentation	Qiuzhao Zhang, Wei Li, Haoran Duan, Jiahui Liang , Wei Duan, Kaikun Zhang , Wenda Wang , Huachao Yang
		SS04_04	Investigation of Building Safety Improvements Based on Agent-Based Evacuation Simulation	Jingjing YAN, Craig Hancock
		SS04_06	Thoughts and Practice on Intelligent Interpretation Services Under Spatial-temporal Concepts for Smart City Resilience	Zhang Jing
16:30	16:50	SS07	Next-Generation Grey, Blue, and Green Infrastructure: Building Resilient Cities to Withstand Extreme Weather Events	Dafang Fu, Mila Avellar Montezuma
		Paper ID	Paper Title	Presenter and authors
		SS07_01	Chloride ion permeability and Frost resistance of alkali-activated steel slag concrete	Yabo Zhang, Chenguang Wang, <u>Wuman Zhang</u>
		SS07_02	Pragmatic Adaptation Framework to Enhance Urban Climate Resilience in Bangkok	Polpat Nilubon, William Veerbeek, Chris Zevenbergen
16:50	17:00	Coffee Break		

2025/7/19 Saturday				
Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
17:00	18:00	SS07	Next-Generation Grey, Blue, and Green Infrastructure: Building Resilient Cities to Withstand Extreme Weather Events	Dafang Fu, Mila Avellar Montezuma
		Paper ID	Paper Title	Presenter and authors
		SS07_03	The study on the impact of ECC protective layer on the chloride ion permeability of RC beams	Yao Ran, Jun Tian, Jieqin Lv, Chaolin Yao, Yu Zhang, Renjuan Sun, Yanhua Guan
		SS07_04	Defect Detection in Municipal Water Pipelines: High-Frequency Acoustic Waves in Turbulent Flow	Yiran CUI
		SS07_05	Evaluating the Impact of Green Infrastructure on Hydrological Connectivity and Ecosystem Carbon Dynamics in Urban Watersheds	Mingzhao XIE
		SS07_06	Implementing the Three-Point Approach for Integrating Blue-Green-Grey Infrastructure by design: Insights from the Zhengzhou Sponge City Initiative	Mila Avellar Montezuma, Frans van de Ven, Chris Zevenbergen, Zihang Ding, William Veerbeek, Gerald Corzo Perez, Junguo Liu
		SS07_07	Integrating Land Use Change Simulation and Flood Resilience Index to Evaluate Urban Flood Mitigation	Yuan-Shun Chang, Hao-Che Ho, Hong-Yuan Lee, Wei-Che Kao
		SS07_08	A Novel Machine Learning Method to Optimize the Joint Operation of Sluice and Pump to Restore Ecological Flow Velocity of Canal Network in Polder Areas	Yizhong Yao, Wentao Pei
18:30	20:30	Banquet Dinner	The Mark Room （4th Floor）	

2025/7/20 Sunday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
9:00	9:50	GS03	Operation and maintenance of urban lifelines	Jin Zhu
		Paper ID	Paper Title	Presenter and authors
		GS03_01	Assessment of segment vulnerability and importance in water distribution systems under multi-failure scenarios based on improved global resilience analysis	Rui Jia , Benwei Hou , Chengshun Xu
		GS03_02	Adaptive Quality Estimating System for Automatic Subgrade Construction	Chi Cheng, Xuefei Wang
		GS03_03	Automatic audio-triggered train-crossing event detection based on edge computing	Xuwen Yu, Yuguang Fu, Ruihua Liang
		GS03_04	Noise Suppression and Drift Correction for Bridge Deformation Monitoring Based on CNN-BiLSTM-Attention	Zheng Li, Shitong Hou, Weihao Sun
		GS03_05	Marker-Free multi-view point cloud stitching for underwater structural inspection: integrating binocular vision and structure from motion	Yuxuan Wang, Shitong Hou, Han Shen, Zhun Wang, Jinpeng Feng
9:50	10:00	Coffee Break		
2025/7/20 Sunday				
Start Time	Finish Time	SAKURA HALL I (3F)	Session Name	Chairs Name
10:00	10:50	SS09	Integrating urban lifelines into broader social and natural system frameworks to promote sustainability	Jingfeng Yuan
		Paper ID	Paper Title	Presenter and authors
		SS09_01	A fairness-based recovery strategy for multi-node damaged infrastructure networks	Haomiao Wang, Jin Zhu
		SS09_04	A Better Understanding of Interdependent Water and Road Infrastructure: A Social-Technical System Perspective	Cong Chen, Jin Zhu, Xiaer Xiahou
		SS09_05	Study on citizen perceptions of landscape focusing on transportation infrastructure in the case of a regional city	Tomohiro Miyazaki, Tetsuo Morita, Shinya Tsukada
		SS09_06	The Impact of Information Infrastructure on Regional Economic Growth: A New Production Factor Perspective	Rui Liu, Jingfeng Yuan
		SS09_07	Real-Time Small Object Detection from Tower Crane Perspective Using Improved YOLO11	Lingxiao Wang, Jingfeng Yuan, <u>Feixiang Hu</u> , Rui Liu, Leqi Chen
11:00	12:00	SAKURA HALL I (3F)	Closing Ceremony	

Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
9:00	9:50	SS08	Urban Computing: A Convergence of Mechanics, Facilities, Data, Logistics, and Management with Emerging Computing Technologies	Zhiqiang Chen
		Paper ID	Paper Title	Presenter and authors
		SS08_01	Classification of Local Buckling in Steel Bridge Piers for Post-Earthquake Emergency Assessment Using Vision Transformers	Hajmousa Lama, Dang Ji
		SS08_02	Data-Driven Optimization for Modern Urban Logistics and Transportation	Haitao Li
		SS08_03	Structural 3D models generation from UAV images by AI using NeRF	Taisuke Kawakami, Ji Dang
		SS08_04	Study on Improvement of Accuracy of UAV Point Cloud Using RTK and GCP for Hydraulic Infrastructures	Kento Yoshida, Ji Dang
		SS08_05	Hybrid BLE-PDR Framework with HMM for Robust Indoor Navigation in Smart Architectural Spaces	Yujin Kuang, Tianyu Li, Yuan Yang, Xiaoguo Zhang
9:50	10:00	Coffee Break		
2025/7/20 Sunday				
Start Time	Finish Time	Meeting Room (5F)	Session Name	Chairs Name
10:00	10:50	SS08	Urban Computing: A Convergence of Mechanics, Facilities, Data, Logistics, and Management with Emerging Computing Technologies	Haitao Li
		Paper ID	Paper Title	Presenter and authors
		SS08_07	Real-Time Individual Localization and Trajectory Analysis for Crowd Safety: A Vision Based Multi-Object Tracking Approach	Hao Li
		SS08_08	Spatiotemporal data Fusion for Urban Water Environment Monitoring Using Unmanned Surface Vehicles	Shicheng Yang
		SS08_09	The Experimental Study on Metal 3D Printing for Repairing Corroded Offshore Steel Structures	Xiang Zhang, Yue Yuan, Chun-lin Wang, Bin Zeng
		SS08_10	Airport Information Model (AIM) architecture design based on digital twin technology	Cong Dou; Jie Ouyang
		SS08_11	Tensile performance of pre-cracked UHPC under the coupled actions of sustained loading and corrosive media	Yiming Yao, Hongrui Zhang, Gan Wu, Xun Lin, Jingquan Wang
11:00	12:00	SAKURA HALL I (3F)	Closing Ceremony	