CONFERENCE PROGRAM

14th ICTTE

2025 14TH INTERNATIONAL CONFERENCE ON TRANSPORTATION AND TRAFFIC ENGINEERING
2025年第14届运输与交通工程国际会议

MEPE 2025年第4届机械与电力工程国际会议
2025 4th International Conference on Mechanical Engineering and Power Engineering

December 19-21, 2025 | 2025年12月19-21日

Time Zone: UTC+8

2025 14th International Conference on Transportation and Traffic Engineering

(ICTTE 2025)

2025 4th International Conference on Mechanical Engineering and Power Engineering

(MEPE 2025)

Wuhan, China | December 19-21, 2025

Sponsored by

武漢理工大學 WUHAN UNIVERSITY OF TECHNOLOGY

Hosted by

武汉理工大学航运学院 SCHOOL OF NAVIGATION · WUHAN UNIVERSITY OF TECHNOLOGY

Supported by

同濟大學 TONGJI UNIVERSITY

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學 DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING 工業及系統工程學系

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Venue: Royal Grand Rezen Hotel; 武汉楚河汉街东湖莱斯丽呈华廷酒店

Add.: No.259 Zhongbei Road, Wuchang District, Wuhan, Hubei, 430070, China; 武汉武昌区中北路 **259** 号 **(**东亭地铁 **D** 出口**)**

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WELCOME MESSAGE

Dear all, we are delighted to welcome you to these conferences 2025 14th International Conference on Transportation and Traffic Engineering (ICTTE 2025), along with 2025 4th International Conference on Mechanical Engineering and Power Engineering (MEPE 2025) to be held in Wuhan, China during December 19-21, 2025, which is sponsored by Wuhan University of Technology (WHUT), China, hosted by the School of Navigation, WHUT, and supported by Tongji University, China, the Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, China and RMIT University, Austrilia.

The objective of the conference is to provide a premium platform to bring together researchers, scientists, engineers, academics and graduate students to share up-to-date research results. We are confident that during this time you will get the theoretical grounding, practical knowledge, and personal contacts that will help you build a long term, profitable and sustainable communication among researchers and practitioners in the related scientific areas.

This year's program is composed of the keynote speeches delivered respectively by Prof. Toshiyuki Yamamoto (Nagoya University, Japan), Prof. Christos Spitas (University of Nottingham, Ningbo, China), Prof. Roberto Montemanni (University of Modena and Reggio Emilia, Italy), Prof. Yong Ma (Wuhan University of Technology, China) and invited talks delivered respectively by Prof. Yi Liu (Wuhan University of Technology, China), Assoc. Prof. Pengfei Sun (Southwest Jiaotong University, China), Assoc. Prof. Tingru Zhang (Shenzhen University, China), Assoc. Prof. Xuting Sun (Shanghai University, China), Assoc. Prof. Xueyan Zhou (Xi'an University of Posts & Telecommunication, China), Asst. Prof. Jiang Wenyu (Shenzhen University, China), Asst. Prof. Junpeng Li (Hefei University, China), Dr. Weibin Dai (SF Technology Co., Ltd., China) with 4 special sessions, 2 on-site technical sessions, 4 online technical sessions and 1 poster session. We would like to express our gratitude to all the speakers in these conferences. Special thanks to all of our committee members, all the reviewers, the attendees for your active participation. We hope the conferences will be proved to be intellectually stimulating to us all. Finally, we wish you very successful conferences!

Conference Organizing Committee

Contact Us

ICTTE 2025	MEPE 2025
Ms. Kristen Zhang	**Ms. Rachel Cao**
Email: ictte2016@vip.163.com	**Email: mepe_conf@yeah.net**

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(in no particular order)

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Shandong Jiaotong University, China
Chengdu University of Information Technology, China
Nirajan Shiwakoti, RMIT University, Australia
Fengfeng Huo, Lucchini Railway Equipment Co.,Ltd., China

GENERAL INFORMATION

A On-site Registration

Registration desk→ Inform the staff of your paper ID→ Sign-in→ Claim your conference kits.

B Devices Provided by the Organizer

Laptops (with MS-Office & Adobe Reader) / Projectors & Screen / Laser Sticks

C Materials Provided by the Presenter

Oral Session: Slides (pptx or pdf version). Format 16:9 is preferred.

Poster Session: Format A1 size is preferred.

Presentation Language: English only.

D Duration of Each Presentation

Keynote Speech: 35min, including 5min Q&A.

Invited Speech: 20min, including 5 min Q&A.

Oral Session: 10min, including 2 min Q&A.

Poster Session: 8min, including 2 min Q&A.

E Notice

※ Please wear your delegate badge (name tag) for all the conference activities. Lending your badge to others is not allowed.

※ Please take good care of your valuables at any time during the conferences. The conference organizer does not assume any responsibility for the loss of personal belongings of the participants during conference day.

F Zoom Meeting

zoom	Room	Meeting ID	Link
✓ Zoom Download ✓ Zoom Background ✓ Conference Banner	A	872 3076 0354	https://us02web.zoom.us/j/87230760354
	B	838 8100 4833	https://us02web.zoom.us/j/83881004833

Note:

1. We recommend to install the Zoom platform beforehand. New users can login the Zoom meeting **without registration**.
2. Please set your display name before joining the online meeting. For instance,

   Committee/Speaker: Committee/Speaker_Name < Committee/Speaker_Veronica Reed >

   Author/Presenter: Paper ID_Name < TT001_Veronica Reed >

   Delegate: Delegate_Name < Delegate_Veronica Reed >

GENERAL INFORMATION

Conference Venue

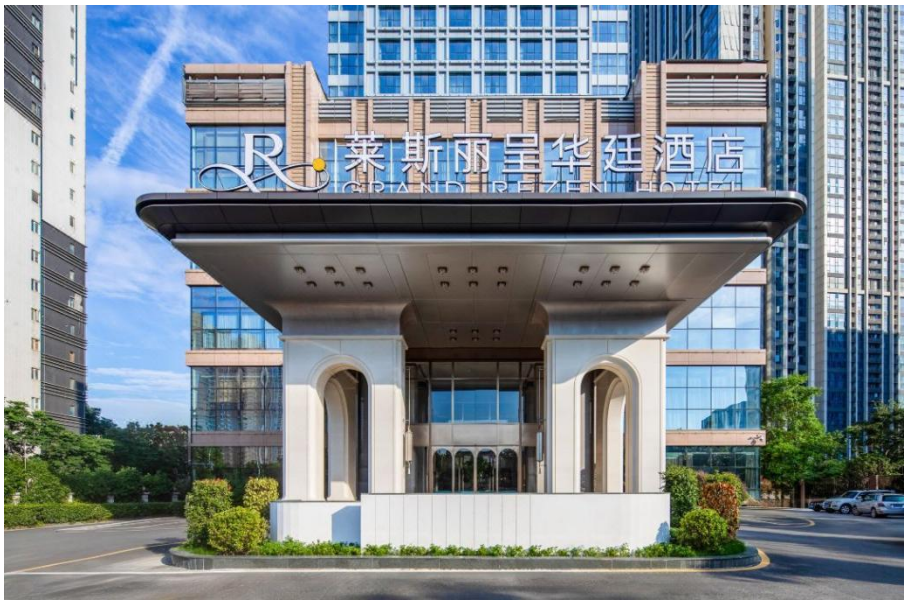
Royal Grand Rezen Hotel

武汉楚河汉街东湖莱斯丽呈华廷酒店

Add.: No.259 Zhongbei Road, Wuchang District, Wuhan, Hubei, 430070, China

武汉武昌区中北路 259 号 (东亭地铁 D 出口)

Tel.:180 7175 3707



Room Reservation

Manager. Zhao | Tel.: 180 7175 3707

When making the reservation, please mention the conference name "ICTTE" to enjoy the special rate.

Meetings Rooms

Main Room 5F Donghu Hall 东湖厅

Session Room 5F Shahu Hall 沙湖厅

5F Changjiang Hall 长江厅

5F Moshan Hall 磨山厅

Poster Session Room 5F Corridor 序厅

Dinning

Lunch 2F Restaurant

Dinner Restaurant

AGENDA OVERVIEW

FRIDAY, DECEMBER 19, 2025 (UTC+8)	
10:00~17:00	On-site Registration <**Lobby, 1F**>
14:00~18:00 Zoom Test Session (Room A: 872 3076 0354, Link: https://us02web.zoom.us/j/87230760354)	
14:00~15:00	TT608 TT516 TT631 TT639 TT629 TT542 TT615 TT524 TT559 TT648 TT630 TT5007 TT706
15:00~16:00	TT557 TT583 TT555 TT603 TT646 TT616 TT505 TT504 TT582 TT595 TT637 TT573 TT715
16:00~17:00	TT517 TT548 TT558 TT599 TT501 TT600 TT590 TT601 TT518 TT529 TT649 TT732 TT636
17:00~18:00	TT532 TT580 TT613 TT714 TT597 TT519 TT562 TT566 TT632 TT647 TT563 TT710 TT717
14:00~18:00	For other online participants, includes but not limited to session chair, committee member, etc.

Presenters are required to join the rehearsal in Zoom on Friday, December 19. Duration: 2~3min apiece. Feel free to leave after you finish the test.

AGENDA OVERVIEW

SATURDAY, DECEMBER 20, 2025 (UTC+8)		
Plenary Session (On-site) | <5F Donghu Hall 东湖厅>		
Chairperson: Chunhui Zhou, Wuhan University of Technology, China (Conference Organizing Co-Chair)		
09:00~09:10	Opening Speech TBA	
Chairperson: Yuanzhou Zheng, Wuhan University of Technology, China (Conference Organizing Co-Chair)		
09:10~09:45	Keynote Speech I *"Commuter Pass and MaaS in Japan"* **Toshiyuki Yamamoto,** Nagoya University, Japan	
09:45~10:20	Keynote Speech II *"Future of Aviation in the Emerging Transportation Landscape and Outlook on its Strategic Technology Development"* **Christos Spitas,** University of Nottingham, Ningbo, China	
10:20~10:50	**Group Photo / Coffee Break <5F Corridor>**	
10:50~11:25	Keynote Speech III *"Drones and Last-mile Logistics"* **Roberto Montemanni,** University of Modena and Reggio Emilia, Italy	
Chairperson: Dr. Abdul Wahid, School of Navigation, Wuhan University of Technology, China		
11:25~12:00	Keynote Speech IV *"Elastic Adaptive DRL-based Intelligent Control Technology for Marine Surface Vessel under High Sea Conditions"* **Yong Ma (国家优秀青年科学基金),** Wuhan University of Technology, China	
12:00~12:20	**Best Paper Award Ceremony**	
12:20~13:30	**Lunch Time <2F Restaurant>**	
SATURDAY, DECEMBER 20, 2025 (UTC+8) | Technical Session (On-site)		
13:30~16:00	**Special Session 1: Governance, Planning and Technology of Urban Low-altitude Traffic Safety** Invited Talk: **Asst. Prof. Wenyu Jiang,** Shenzhen University, China TT626 TT513 TT656 TT652 TT578 TT554 TT571 TT659 TT5005 TT666 TT503 TT638 TT653	**<5F Shahu Hall 沙湖厅>**
13:30~15:30	**Special Session 2: The Nexus of Air Transport Sustainability, Efficiency and Scalability** Invited Talk: **Assoc. Prof. Xuting Sun**, Shanghai University, China; **Assoc. Prof. Xueyan Zhou**, Xi'an University of Posts & Telecommunication, China; **Dr. Weibin Dai**, SF Technology Co., Ltd., China TT658 TT661 TT650 TT642 TT567 TT612	**<5F Changjiang Hall 长江厅>**
13:30~14:50	**On-site Session 5: System Model, Functional Control Design and Mechanical Analysis in Intelligent Mechanical Systems** Invited Talk: **Assoc. Prof. Pengfei Sun**, Southwest Jiaotong University, China; **Asst. Prof. Junpeng Li**, Hefei University, China TT593 TT703-A TT712 TT605 TT713	**<5F Moshan Hall 磨山厅>**

13:30~16:00	**Poster Session: Collaborative Optimization of Multimodal Transport System, Modeling of Traffic Behavior and Safe Operation** TT556 TT589 TT547 TT594 TT620 TT5002 TT5003 TT544 TT716 TT539 TT705 TT643 TT633 TT528 TT527 TT531 TT526 TT572 TT5006 TT621	**<5F Corridor 序厅>**
15:30~16:00	**Coffee Break <5F Corridor>**	
16:00~18:30	**Special Session 3: Next Generation Autonomous Transportation Systems** Invited Talk: **Prof. Yi Liu**, Wuhan University of Technology, China TT521 TT645 TT657 TT602 TT655 TT662 TT550 TT664 TT663 TT665 TT537 TT654 TT617	**<5F Shahu Hall 沙湖厅>**
16:00~18:20	**Special Session 4: Autonomous Perception and Decision-Making Control for Multiple Carriers under the Three-Dimensional Transportation** Invited Talk: **Assoc. Prof. Tingru Zhang**, Shenzhen University, China TT644 TT535 TT624 TT628 TT551 TT564 TT536 TT625 TT610 TT507 TT634 TT5004	**<5F Changjiang Hall 长江厅>**
16:00~17:50	**On-site Session 6: Motor Digital Twin Modeling, Adaptive Collaborative Control and Energy Management** Invited Talk: **Assoc. Prof. Xingang Yang**, Xi'an University of Technology, China TT711 TT726 TT709 TT720 TT718 TT723 TT719 TT724 TT725 TT707	**<5F Moshan Hall 磨山厅>**
18:30~20:30	**Dinner Time <Restaurant>**	

AGENDA OVERVIEW

SUNDAY, DECEMBER 21, 2025 (UTC+8) | Technical Session (Online) <Room A: 872 3076 0354, https://us02web.zoom.us/j/87230760354>	
9:30~11:40	**Online Session 1: Optimization of Modern Intelligent Logistics System and Traffic Accident Management** TT608 TT516 TT631 TT639 TT629 TT542 TT615 TT524 TT559 TT648 TT630 TT5007 TT706
13:30~15:40	**Online Session 3: Collaborative Control and Scheduling of Multiple Transportation Modes in Intelligent Transportation Networks** TT517 TT548 TT558 TT599 TT501 TT600 TT590 TT601 TT518 TT529 TT649 TT732 TT636
<Room B: 838 8100 4833, https://us02web.zoom.us/j/83881004833>	
9:30~11:40	**Online Session 2: Digital Intelligent Transportation Policy Analysis, Industry Services and Future Planning** TT557 TT583 TT555 TT603 TT646 TT616 TT505 TT504 TT582 TT595 TT637 TT573 TT715
13:30~15:40	**Online Session 4: Infrastructure Status Monitoring and Traffic Environment Perception Analysis** TT532 TT580 TT613 TT714 TT597 TT519 TT562 TT566 TT632 TT647 TT563 TT710 TT717

INTRODUCTION OF KEYNOTE SPEAKER

09:10-9:45 | Dec. 20, 2025 | 5F Donghu Hall 东湖厅

Toshiyuki Yamamoto

Nagoya University, Japan

Speech Title: Commuter pass and MaaS in Japan

Abstract: This presentation examines the structure, challenges, and evolving innovations of Japan's commuter pass within the broader context of mobility-as-a-service (MaaS) development. Using examples primarily from Nagoya and other metropolitan regions, it highlights how traditional commuter passes—long a foundation of Japan's public transport usage—are being adapted to support more flexible, multimodal, and user-centered mobility offerings.

The presentation begins by explaining the logic of the Nagoya subway commuter pass, which is based on the "single continuous line" rule: routes must not overlap, duplicate stations, or branch, and fares are determined strictly by route length. This long-standing system, while simple and predictable, constrains multimodal integration and limits users' ability to choose alternative travel paths across densely connected rail networks, as illustrated by diagrams of central Nagoya and regional inter-operator maps.

The presentation then introduces empirical evidence from smart-card data showing age-dependent differences in spatiotemporal travel entropy, suggesting that non–pass holders exhibit greater variability in travel patterns than pass holders. This supports the hypothesis that fixed-route commuter passes may reduce users' willingness to deviate from habitual paths.

Subsequently, MaaS initiatives in Japan are introduced through the example of Kansai MaaS, which integrates rail, bus, taxi, bike share, tourism products, and even retail into a multilayered ecosystem supported by private operators and local governments. Additionally, emerging fare innovations—such as Fukuoka city subway's post-pay fare caps and flexible multipath commuter passes offered by Tobu and Seibu railways—demonstrate industry-wide movement toward more adaptive, user-friendly fare structures.

The Presentation's core empirical contribution is a 2025 Nagoya survey evaluating willingness to buy and willingness to pay for expanded commuter-pass bundles that include downtown station access, bus routes, and bike sharing. Price sensitivity meter (PSM) analyses indicate optimal monthly additional prices around JPY 900–1,000, with higher acceptance for bundles incorporating multimodal benefits. Behavioral responses to congestion reduction options (e.g., shifting from the crowded Higashiyama line to the Sakura-dori line) and potential increases in downtown activities under bundled plans are also analyzed, demonstrating induced demand for central-city engagement.

Finally, the study explores "mobility as a feature (MaaF)" subscription models, showing how multiservice bundles—combining mobility, delivery, media, and entertainment—could scale MaaS adoption by aligning diverse lifestyle services with mobility packages.

Overall, the presentation illustrates how Japan's commuter-pass paradigm is gradually evolving toward more flexible, integrated, and user-responsive mobility systems that support the broader objectives of MaaS.

Biography: Toshiyuki Yamamoto is Professor of Transportation Planning and Vice Director of Institute of Materials and Systems for Sustainability at Nagoya University, Japan. Prior to Nagoya University, he served as Research Associate at Kyoto University, Japan, where he obtained Doctor of Engineering in 2000. His research interests are next-generation mobility, activity-travel behavior, traffic safety, etc. He is Principal Investigator of the project, Optimization of carbon emission management policy and low-carbon travel induction strategies for demand-responsive transportation systems, bilaterally funded by NSFC and JSPS. He serves as Associate Editor for the journal, Transportation, and International Steering Committee Member for International Conference on Transport Survey Method.

INTRODUCTION OF KEYNOTE SPEAKER

09:45-10:20 | Dec. 20, 2025 | 5F Donghu Hall 东湖厅

Christos Spitas

University of Nottingham, Ningbo, China

Speech Title: Future of Aviation in the Emerging Transportation Landscape and Outlook on its Strategic Technology Development

Abstract: The global transportation ecosystem is undergoing a profound transformation driven by demands for greater efficiency, sustainability, and connectivity. Within this shifting landscape, the Low-Altitude Economy (LAE)—encompassing commercial activities facilitated by UAVs and eVTOLs—represents the most disruptive frontier in aviation, with potential to revolutionise urban logistics, passenger transport, and service delivery, among other applications. This keynote addresses the critical prospects and strategic technological imperatives for realising the LAE, focusing specifically on achieving sustainability, reliability, and robust business integration. Key technology enablers include: a) advancements in enabling technologies for powertrain and airframe subsystems (high-density and hybrid power sources, lightweight airframe design, low-noise propulsion, robustness and fail-safety); b) the deployment of sophisticated Sense-and-Avoid (SAA) systems and secure multi-source navigation to ensure operational safety and aircraft reliability; and c) the development of an intelligent Unmanned Aircraft System Traffic Management (UTM) system to safely manage high-density air traffic and facilitate seamless integration with ground infrastructure via strategic vertiport construction.

The presentation will analyse how these technological and infrastructural elements must converge, proposing a strategic roadmap for their coordinated development and deployment. This includes advocating for the necessary regulatory and institutional frameworks to accelerate the transition from isolated trials to a fully integrated, commercially successful, and environmentally responsible low-altitude transportation network. By focusing on these pillars of technology and integration, this address aims to provide a clear outlook on how aviation will maintain its central, evolving force in the future of global mobility.

Concluding the discussion, the system-level question of environmental sustainability and business integration will also be formulated in an actionable manner.

Biography: Christos Spitas is professor of Aerospace Engineering and head of the Department Mechanical, Materials and Manufacturing Engineering at the University of Nottingham, Ningbo, China (UNNC). Prior to this appointment he served as professor of Machine Design and head of the Space, Industry and Transportation Cluster at Nazarbayev University, professor of Embodiment Design and head of the Product Engineering Section in the Dept. of Design Engineering at Delft University of Technology, and in various positions in the industry up to Manager Research and Development, working with clients such as ESA, Thales, CERN, Toyota etc.

INTRODUCTION OF KEYNOTE SPEAKER

10:50-11:25 | Dec. 20, 2025 | 5F Donghu Hall 东湖厅

Roberto Montemanni

University of Modena and Reggio Emilia, Italy

Speech Title: Drones and last-mile logistics

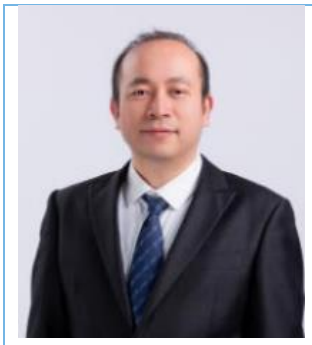
Abstract: Unmanned vehicles, and particularly aerial drones, are attracting growing interest across multiple sectors, from precision agriculture to disaster management and freight delivery. Recent advances in hardware and software have transformed drones into practical and reliable tools for a wide range of applications, although some operational and legal challenges still remain. In this work, we focus on the use of drones in last-mile logistics, specifically for delivering goods to final-customers. Many operators are making significant investments in these solutions, driven by the potential economic benefits and the greater flexibility compared to traditional delivery methods. We examine the impact of drones when deployed alongside trucks in a hybrid delivery system, analysing the problem from both an economic and optimisation perspective. Simulations based on real-world scenarios allow us to quantify the potential economic gains that distribution companies can achieve by integrating drones into their operations.

Biography: Dr. Roberto Montemanni is a Full Professor at the Faculty of Sciences and Methods for Engineering of the University of Modena and Reggio Emilia in Italy since 2019. Previously, he was a Full Professor at the Dalle Molle Institute for Artificial Intelligence of the University of Applied Sciences of Southern Switzerland, Lugano, Switzerland.
He received a Laurea Degree in Computer Science from the University of Bologna, Italy in 1999, and he obtained a Ph.D. degree in Applied Mathematics from the University of Glamorgan, Wales, UK in 2002. In 2015 he spent time as a Visiting Professor at the South China University of Technology, Guangzhou, China.
He is the author of over 240 scientific contributions on top Journals and Conferences, with algorithmic and mathematical modelling contributions in different fields such as bioinformatics, healthcare, industrial engineering, logistics and transportations, with emphasis on the last two domains. He recently received the prize for the Best Paper of year 2024 from the International Transactions in Operational Research for a work on the use of drones for logistics.

In the past, he served as an editor for several journals, and he is currently Section Editor-in-Chief for Algorithms. In the last 15 years he chaired dozens of International conferences and in he also delivered several Keynote speeches. He led basic and applied research projects for millions of Euros both at a national (Swiss and Italian) and European levels.

INTRODUCTION OF KEYNOTE SPEAKER

11:25-12:00 | Dec. 20, 2025 | 5F Donghu Hall 东湖厅



Yong Ma

Wuhan University of Technology, China

Speech Title: Elastic Adaptive DRL-based Intelligent Control Technology for Marine Surface Vessel under High Sea Conditions

Abstract: The adverse marine environments under high sea conditions pose a challenge to the training of decision-making networks using deep reinforcement learning (DRL). In response to the difficulties Marine Surface Vessels face in coping with severe nonlinear dynamics and violent motion responses induced by rough seas, this presentation introduces a generalized elastic adaptive deep reinforcement learning framework for autonomous navigation. This framework employs a two-stage training strategy comprising function learning and optimization learning. During the function learning stage, a task-adaptive observed behavior classification technique is utilized to decouple the high-dimensional state space into sub-spaces, and identify classic states and actions. During the optimisation learning stage, adaptive exploration within localised state subspaces is then constructed. Compared to traditional DRL approaches, this framework ensures that the decision-making network extracts stable and effective knowledge from complex state-action spaces, thereby enhancing the algorithm's adaptive capabilities. Finally, applications stemming from this research are outlined.

Biography: Yong Ma is a professor at the School of Navigation, Wuhan University of Technology, and serves as chief scientist for direction two at the State Key Laboratory of Maritime Technology and Safety. Prof. Ma is listed in the World Ranking Top 2% Scientists list, he is a Senior Member, IEEE, and serves as an associate editor for IEEE TII. His research interests primarily focus on intelligent navigation theory and technology for marine vessels as well as intelligent maritime safety systems. Prof. Ma has presided over a National Key R&D plan and published more than 70 journal papers including IEEE Trans, Scientia Sinica Technological Sciences, and received a first-class prize at the provincial/ministerial level as the lead investigator.

INTRODUCTION OF INVITED SPEAKER

Yi Liu
Wuhan University of Technology, China

16:00-16:20| Dec. 20, 2025 | <5F Shahu Hall 沙湖厅>

Speech Title: Simulation Modeling and Analysis of Vessel Traffic in Busy Waters

Abstract: With the rapid development of waterborne transportation system, the contradiction between growing traffic demand and limited navigation capacity in busy waters has become increasingly prominent. To address challenges such as complex vessel behaviors, heterogeneous traffic flows, and inefficient traffic organization in port channels and key hydraulic project waters, this speech presents a series of modeling and simulation studies on vessel traffic in busy waters.

First, a heterogeneous traffic flow simulation model for port channels is developed by integrating dynamic safety distance calculations with a dual-speed control strategy. By combining Discrete Wavelet Transform (DWT) and DBSCAN for trajectory clustering, and adopting an attention-based LSTM-LUBE framework for vessel speed interval prediction, the model effectively captures the movement characteristics of both manned and autonomous vessels.

Second, for large-scale, multi-node systems such as the Three Gorges Dam area, a coupled cellular automaton and multi-agent simulation model is developed to evaluate linkage control strategies. By modeling anchorages, locks, and channels as interactive agents, the framework accurately simulates vessel queuing and waiting dynamics under different control scenarios.

These studies provide scientific support for capacity evaluation, traffic organization optimization, and intelligent management in complex inland and coastal waterways, contributing to the safe, efficient, and sustainable development of modern waterborne transportation systems.

Biography: Yi Liu is a professor at the School of Navigation, Wuhan University of Technology. His teaching and research areas include marine traffic management, vessel traffic flow theory, artificial intelligence, and smart maritime technologies. He has led two projects funded by the National Natural Science Foundation of China and two sub-projects under the National Key Research and Development Program, as well as over ten educational and scientific research projects supported by the Hubei Provincial Natural Science Foundation, the Ministry of Education's employment-oriented education initiatives, and industry-university collaboration programs. He has authored more than 30 journal papers in internationally renowned journals in the field. He is also the author of two academic books and textbooks: Theory and Technology of Ship Traffic Flow and Introduction to Maritime Support. His research achievements have been recognized with one provincial and ministerial-level first prize, and he holds more than ten items of independent intellectual property rights.

Pengfei Sun

Southwest Jiaotong University, China

13:30-13:50| Dec. 20, 2025 | <5F Moshan Hall 磨山厅>

Speech Title: From Model-Driven to LLM-Augmented Intelligence: Taking trajectory Optimization as Examples

Abstract: The increasing demands for safety, efficiency, and energy conservation in railway transportation have driven continuous innovation in train operation control. Focusing on train trajectory optimization as a case, this presentation showcases the evolution of the field from model-driven methods to LLM-augmented intelligence, with a focus on the presenter's research progress. First, model-based train trajectory optimization technologies are introduced, alongside extended research on multi-system and multi-objective optimization in the railway domain. Additionally, engineering application cases of on-board equipment are presented, where the aforementioned technologies have been practically applied. Subsequently, based on an analysis of the limitations of model-based methods, the phased progress of recent LLM-based research efforts is shared. Specifically, a LLM-integrated trajectory optimization approach. A prompt engineering framework is proposed, which integrates domain knowledge with LLM's reasoning capabilities to generate customizable and executable optimization tools. Experimental results show that this framework achieves an average of 85.9% consistency with numerical simulations while significantly reducing expert dependency.

Biography: Pengfei Sun is an Associate Professor and Doctoral Supervisor at Southwest Jiaotong University, and a member of the Key Laboratory of Railway Industry of Advanced Energy Traction and Comprehensive Energy Conservation. His main research focuses on automatic train operation and energy conservation of rail transit systems. Over the past five years, he has led and contributed to 7 national projects and 10 enterprise-funded projects. He has published 57 SCI-indexed papers and holds 41 domestic and 2 international invention patents. His research outcomes have been recognized with the First Prize of Sichuan Provincial Science and Technology Progress Award, the First Prize of China Railway Society Science and Technology Progress Award, and the National Railway Youth Science and Technology Innovation Award. Multiple technologies he pioneered have been engineered for practical application and successfully deployed in on-board train equipment.

Tingru Zhang

Shenzhen University, China

16:00-16:20| Dec. 20, 2025 | <5F Changjiang Hall 长江厅>

Speech Title: EEG-based Assessment of Driver Trust

Abstract: Effective collaboration between automated vehicles (AVs) and human drivers relies on maintaining an appropriate level of trust. However, real-time assessment of human trust remains a significant challenge. While initial efforts have delved into the potential use of physiological signals, such as skin conductance and heart rate, to evaluate trust, limited attention has been given to the feasibility of assessing trust through

electroencephalogram (EEG) signals. This study aimed to address this issue by using EEG signals to objectively assess driver trust towards AVs. A total of 420 time- and frequency-domain EEG features were extracted, and nine machine learning algorithms were applied to construct driver trust assessment models. Additionally, to explore the potential of developing cost-effective models with reduced feature inputs, this study developed trust models using features solely from single brain regions: frontal, parietal, occipital, or temporal. The results showed that the best-performing model, utilizing features from the whole brain and employing the Light Gradient Boosting Machine (LightGBM) algorithm, achieved an accuracy of 88.44% and an F1-score of 78.31%. In comparison, models based on single brain regions did not achieve comparable performance to the comprehensive model. However, the frontal and parietal regions showed important potentials for developing costeffective trust assessment models. This study also performed feature analysis on the best-performing model to identify features highly responsive to changes in trust. The results showed that an increased power of beta waves tended to indicate a lower level of trust in AVs. These findings contribute to our understanding of the neural correlates of trust in AVs and hold practical implications for the development of trust-aware AV technologies capable of adapting and responding to driver's trust levels effectively.

Biography: Tingru Zhang is an associate professor at the Institute of Human Factors and Ergonomics, Shenzhen University, and Guest Researcher at the CGN National Key Laboratory. Her main research focuses on intelligent transportation, human-AI interaction, and smart interaction & user experience. She has led over 10 research projects. With more than 50 publications, her work includes 1 ESI Hot Paper and 1 Highly Cited Paper. She currently serves as an editorial board member for Transportation Research Part F and International Journal of Ergonomics, and has been recognized with honors such as the Top 2% Most-Cited Scientists Worldwide (2023, 2024) and the Outstanding Early Career Award from the International Ergonomics Association (2023).

Xuting Sun

Shanghai University, China

13:30-13:50| Dec. 20, 2025 | <5F Changjiang Hall 长江厅>

Speech Title: An Interactive Decision Making Framework Design for the Outsourcing Cooperation between the Service Provider and the Airline: An Exact Bilevel Method

Abstract: In reality, more and more airlines outsource maintenance tasks to the MRO service providers to achieve cost-effective operational planning. However, in actual operations, the MSP may not be able to provide "mutually beneficial" maintenance services to its customers due to its resource scarcity and the lack of information sharing. Therefore, in this paper, based on industry practices we model an aviation service supply chain consisting of one MSP and one airline, in which the MSP may provide maintenance services to multiple airlines with limited spatiotemporal resources with different prices. A bilevel mixed integer programming (MIP) model is formulated to characterize the interactive decision-making structure between the MSP and the airline that aims to help increase the operational efficiency of both the MSP and the airline. An exact bilevel solution framework is developed which is verified to achieve convergence and obtain the bilevel optimality. Through the proposed algorithm, the computational study is further conducted based on the actual operational data from one of the biggest Chinese airline companies. The results verify that, compared to the benchmark, the proposed bilevel model can achieve Pareto improvement. In addition, the sensitivity analyses regarding pricing, flexible maintenance resources and opportunity cost coefficients verify the effectiveness and robustness of the proposed bilevel model, and further derive some useful managerial insights for both the MSP and the airline at strategic and operational levels.

Biography: Dr. Xuting Sun is an Associate Professor at SILC Business School, Shanghai University. She received her Ph.D. from the Department of Industrial and Systems Engineering at the Hong Kong Polytechnic

University. Her research interests are in modeling and optimization of complex systems under uncertainty, in the fields of aviation, logistics, and supply chain management, and her publications appear in Transportation Research Part B/C/E, Decision Sciences, IEEE-TEM, IEEE-TSMCS, IEEE-TITS, Decision Support Systems, etc. She serves as Editorial Board members in Transportation Research Part E, IEEE Transactions on Engineering Management. She also edited several special issues in SCI/SSCI journals, e.g., TRE, JATM, IEEE-TEM. She has been the principal investigator of several research projects granted by the National Natural Science Foundation of China and the Science and Technology Commission of Shanghai Municipality.

Xueyan Zhou

Xi'an University of Posts & Telecommunication, China

13:50-14:10| Dec. 20, 2025 | <5F Changjiang Hall 长江厅>

Speech Title: Research on Resilience Assessment of Multimodal Transportation Networks

Abstract: Enhancing the resilience of transportation networks is a key factor in ensuring the sustainable development of urban agglomerations. This study constructs an integrated transportation network (ITN) consisting of aviation, high-speed rail, and highways. A multi-stage resilience assessment method is proposed, which comprehensively considers both network structural and functional performance. Using failure scenario simulation, this study systematically analyzes the resilience of the ITN under disturbances. Additionally, the ITN performance curves under two distinct recovery strategies are analyzed. The results indicate that the ITN demonstrates stronger resistance to disturbances compared to sub-networks. Under different attack scenarios, the ITN consistently exhibits greater resilience. The research findings provide important theoretical support for enhancing the resilience of ITN in urban agglomerations.

Biography: Zhou Xueyan, an associate professor and a master's supervisor. Her main research area is the resilience of transportation networks. She has led five provincial and ministerial-level scientific research projects, including the Youth Talent Support Program of the Shaanxi Association for Science and Technology, the Shaanxi Natural Science Foundation, and the Shaanxi Social Science Fund. She has published 16 high-level papers as the first author or corresponding author and has been granted six national invention patents as the first inventor.

Jiang Wenyu

Shenzhen University, China

13:30-13:50| Dec. 20, 2025 | <5F Shahu Hall 沙湖厅>

Speech Title: UAV-Based Intelligent Vision Framework for Disaster Risk Early-Warning: A Case Study of Wildfire Identification

Abstract: Low-altitude UAVs serve as critical aerial transportation platforms with significant potential in emergency management due to superior maneuverability, flexibility, and visual coverage. However, motion

blur induced by high-speed flight severely degrades visual image quality, constraining practical deployment efficacy. This study develops an UAV-based intelligent visual warning framework, with wildfire identification as a representative case.
The FLAME benchmark dataset for drone-based wildfire detection is employed, and a physics-driven blurring algorithm simulates image degradation under varying flight parameters. With ResNet-50 and Vision Transformer (ViT) as baseline models, transfer learning is introduced to enhance motion-blur robustness. Results reveal that on pristine data, ViT (OA: 99.67%, F1: 99.73%) slightly outperforms ResNet-50 (OA: 98.50%, F1: 98.81%). Under motion degradation (motion index=25), ViT (OA: 88.56%) shows significant superiority over ResNet-50 (OA: 82.93%, ~6%↓). Furthermore, the transfer-enhanced ViT-Pre model (OA: 92.47%) achieves a 3.91-point OA gain versus native ViT (~4%↓), demonstrating the efficacy of transfer learning in compensating motion-blur-induced accuracy loss. This work provides practical insights for robust vision system design in dynamic UAV-based disaster risk early-warning systems.

Biography: Dr. Jiang Wenyu is an Assistant Professor and Master's Supervisor at Shenzhen University, holding a Ph.D. in Engineering Physics from Tsinghua University. His research focuses on intelligent monitoring of transportation infrastructure, computer vision & spatial intelligence, and disaster reduction & emergency management. He has led/participated in multiple national and provincial research projects, including the National Key R&D Program of China, and Guangdong Provincial Key R&D Initiatives. As the first/corresponding author, he has published 20+ papers in top-tier journals such as International Journal of Applied Earth Observation and Geoinformation, Environmental Modelling & Software, and International Journal of Disaster Risk Reduction. He holds 5 invention patents and 5 software copyrights, and was twice awarded the Grand Prize of Guangdong Provincial Science & Technology Progress Award in Emergency & Safety (2023, 2024). His innovations have been deployed by emergency management agencies in Guangdong, Sichuan, Zhejiang, and Heilongjiang provinces, providing critical technical support for disaster management.

Junpeng Li

Hefei University, China

13:50-14:10| Dec. 20, 2025 | <5F Moshan Hall 磨山厅>

Speech Title: Study on the Growth Trend of Hook-Type Crack in the Rail Crown of Heavy-haul Railway

Abstract: Rolling contact fatigue (RCF) crack occurred in the rail surface and its consequence as spalling are the main defects effecting the rail life of the heavy-haul railway in China. Microscopic observations revealed that the cracks occurred at rail crown propagated inside the rail in a curve, hook-type shape with obvious route changing. Using X-ray tomography to measure the fatigue crack of hook-type rolling contact on the top surface of heavy rail, an extended finite element-based hook-type crack growth prediction method was established, and the spatial expansion characteristics of cracks of different depths were studied. The results show that: under the vehicle load, the growth of the hook-type crack is a composite cracking combining the effects of opening, sliding and tearing; for cracks with shallow depth, i.e. 1/3 and 1/2 depth cracks where path transformation has not yet occurred, the growth rate is faster; when the crack growth to a certain depth and path transformation occurs, the growth effect of the crack gradually decreases and an obvious bent hook is gradually formed; The predicted crack growth length through the total weight at 150 MGT is 0.389 mm, and the fastest growth location is near the middle of the crack tip, which is close to the real crack observed by microscopy.

Biography: Dr. Li Junpeng is an Assistant Professor and Master's Supervisor at Hefei University, holding a Ph.D. in Transportation engineering from Tongji University. He is mainly engaged in the research work of urban rail transit engineering management, rail maintenance and repair, track infrastructure condition monitoring, and track vibration and noise reduction. He has led/participated in multiple national and provincial

research projects, including the National Key R&D Program of China, and Anhui Provincial Key R&D Initiatives. As the first/corresponding author, he has published 15+ papers in top-tier journals such as Tribology International, Wear, and Fatigue Fracture of Engineering Materials Structures.

Weibin Dai

SF Technology Co., Ltd., China

14:10-14:30| Dec. 20, 2025 | <5F Changjiang Hall 长江厅>

Speech Title: Introduction to Air Cargo Transportation in SF Express

Abstract: SF Express has the largest freighter aircraft fleet in China. Based on this fleet, SF Express has maintained a significant advantage in logistics timeliness assurance compared to other express companies. In this report, a freighter flight network with hub-and-spoke structure and direct arcs is introduced. Because of the full-container and mixed-container transfer at the hub airport, a three-layer decision framework (aircraft/flight & container & shipping space) is constructed for the freighter flight network. Compared to passenger aviation, the air cargo network is more flexible (and more complex) in terms of adjustments. Therefore, three different versions of methods are tried for freighter network scheduling, i.e., local search with customized operators, column-and-row generation, and ALNS with reinforcement learning. Due to the high entry barrier of business knowledge and the complexity of model parameter input, we build an AI-agent-based architecture to reduce the complexity of implementation and usage of the freighter network scheduling model. In the future, we advocate for the further promotion of AI agent-based operational systems to achieve a more intelligent business decision-making chain.

Biography: Dr. Weibin Dai is an senior algorithm engineer of operations research in SF Technology Co., Ltd. He received his Ph.D. from the School of Electronic Information Engineering at Beihang University in 2021. His research interests are in models and algorithms of transportation network design. His publication appear in Transportation Science, IEEE Transactions on Intelligent Transportation Systems, Computers & Industrial Engineering, Computers & Operations Research, etc. In SF Technology, he participated in projects including the planning of ground trunk line network and the planning & scheduling of freighter flight network in SF Express. He was responsible for the design and development of key models and algorithms, and drove the implementation of the solutions to the real-world scenarios.

Xingang Yang

Xi'an University of Technology, China

16:00-16:20| Dec. 20, 2025 | <5F Moshan Hall 磨山厅>

Speech Title: Design, Analysis, and Development Technologies for CNC Manufacturing Equipment

Abstract: NC manufacturing equipment serves as the mother machine and core foundation of the modern industrial system. In alignment with the national strategic need for the independent development of high-end equipment, our research team has long been dedicated to the study of design, analysis, and development technologies for NC manufacturing equipment. This report introduces the relevant work completed by our team: (1) Technology for analyzing the dynamic characteristics of complete NC machine tools, involving the establishment and analysis of dynamic models, and modal testing and analysis of entire machine tool; (2) Methods for predicting and analyzing the surface profile evolution of lapping pairs in ultra-precision machining; (3) NC machine tool testing and compensation technologies, involving error modeling, detection of complete machine characteristics, and identification of error parameters; (4) Practice in the research & development and machining application of NC equipment.

Biography: Ph.D., Associate Professor , Master's Supervisor, Department of Mechanical Manufacturing and Automation, School of Mechanical Engineering , Xi'an University of Technology.His research primarily focuses on the following areas: (1) Development of Automated Manufacturing Equipment; (2) Precision Measurement, Error Analysis, and Compensation for CNC Machine Tools; (3) Vision-Based Measurement and 3D Reconstruction; (4) Simulation and Accuracy Prediction for Finishing Processes.

SPECIAL SESSION 1

SATURDAY, DECEMBER 20, 2025 <13:30~16:00>	<5F Shahu Hall 沙湖厅>

Session Title: Governance, Planning and Technology of Urban Low-altitude Traffic Safety

Chairperson: Prof. Liu Dan, Wuhan University of Technology, China

13:30~13:50 Invited Talk	UAV-Based Intelligent Vision Framework for Disaster Risk Early-Warning: A Case Study of Wildfire Identification **Asst. Prof. Jiang Wenyu, Shenzhen University, China**
13:50~14:00 TT626	Event-Triggered DDPG for Adaptive ILOS-Based Ship Path Following Under Marine Disturbances **Zhipeng Deng, Wuhan University of Technology, China**
14:00~14:10 TT513	Exploration on Emergency Evacuation Standards for Urban Rail Transit Industry **Huajun Guo, China Railway Investment Group Transportation Operation Co., Ltd, China**
14:10~14:20 TT656	A Fuzzy AHP-Based Approach for Evaluating Maritime Search and Rescue Emergency Response Capability **Xuesong Zhang, Wuhan University of Technology, China**
14:20~14:30 TT652	A Novel Method for Disaster Monitoring, Analysis and Assessment of Impact on Power Grids for Typhoon based on UAVs **Chuhao Lin, Jinan University, China**
14:30~14:40 TT578	Key Risk Vessels Identification Based on Hypernetwork **Ce Bian, Wuhan University of Technology, China**
14:40~14:50 TT554	Urban ground infrastructure planning under the background of low air economy — Taking Wuhan as an example **Liu Meng, Wuhan University of Technology, China; Hubei Longzhong Laboratory, China**
14:50~15:00 TT571	Multi-Objective Optimization of Fresh Produce Cold Chain Multimodal Transport Routing under Uncertain Ambient Temperatures **Rui Huang, Wuhan University of Technology, China**
15:00~15:10 TT659	Computational Fluid Dynamics-Driven Analysis of Urban Low-Altitude Wind Fields on UAV Flight Safety with ALCFDoerX **Hang Shao, College of Hydraulic and Environmental Engineering, China Three Gorges University, China**
15:10~15:20 TT5005	Intelligent Management of Wuhan's Low-Altitude Traffic for Safe Collaboration: Key Issues and Technical Framework **Xue Qian, Wuhan University of Technology, China**
15:20~15:30 TT666	Offloading Strategies for Collaborative Cloud-Edge Computing Resources in Highway Service Areas with Unmanned Aerial Vehicles **Dong Wei, Shenzhen Technology University, China**
15:30~15:40 TT503	Study of Air Pollutants Emission Inventory During Ships Passing through the Large Navigable Tunnels **Yiduo Wang, Wuhan University of Technology, China**

15:40~15:50 TT638	Research on the Development Status, Challenges and Innovation Paths of China's Cold Chain Logistics Industry **Zihao Wang, Liaoning Technical University, China**
15:50~16:00 TT653	Path Planning for Integrated Sea-Air Unmanned Platforms under Communication Constraints **Fenggang Zhang, Wuhan University of Technology, China**

SPECIAL SESSION 2

SATURDAY, DECEMBER 20, 2025 <13:30~15:30> | **<5F Changjiang Hall 长江厅>**

Session Title: The Nexus of Air Transport Sustainability, Efficiency and Scalability

Chairperson: Prof. Xiaoqian Sun, Beihang University, China

13:30~13:50 Invited Talk	An Interactive Decision Making Framework Design for the Outsourcing Cooperation between the Service Provider and the Airline: An Exact Bilevel Method **Assoc. Prof. Xuting Sun, Shanghai University, China**
13:50~14:10 Invited Talk	Research on Resilience Assessment of Multimodal Transportation Networks **Assoc. Prof. Xueyan Zhou, Xi'an University of Posts & Telecommunication, China**
14:10~14:30 Invited Talk	Introduction to Air Cargo Transportation in SF Express **Dr. Weibin Dai, SF Technology Co., Ltd., China**
14:30~14:40 TT658	A Probability-of-Containment A* Algorithm for USV Coverage Path Planning in Maritime Search and Rescue **Yuhang Lv, Wuhan University of Technology, China**
14:40~14:50 TT661	A Novel Ship Path Planning Method for Ships in Inland Anchorages **Wenqing Bai, Wuhan University of Technology, China**
14:50~15:00 TT650	Autonomous Vehicle Rental: A Reliable Pathway to Achieve Transportation System Automation **Yuxin Niu, Research Institute of Highway, Ministry of Transport, China**
15:00~15:10 TT642	3D Path Planning for Unmanned Aerial Vehicle Based On an Improved Particle Swarm Optimization **Junjie Wang, Wuhan University of Technology, China**
15:10~15:20 TT567	Research on Three-Dimensional Path Planning for Ships in Coastal Waters Based on the Heuristic Harris Hawks Optimization Algorithm **Guanliang Zhou, Wuhan University of Technology, China**
15:20~15:30 TT612	Fixed-time Trajectory Tracking of Underactuated Surface Vessels via FT-NTSM and ESO under PM-Spectrum Disturbances **Xingsheng Zhang, Wuhan University of Technology, China**

ON-SITE SESSION 5

SATURDAY, DECEMBER 20, 2025 <13:30~15:00>	<5F Moshan Hall 磨山厅>

Session Title: System Model, Functional Control Design and Mechanical Analysis in Intelligent Mechanical Systems

Chairperson: Assoc. Prof. Pengfei Sun, Southwest Jiaotong University, China

13:30~13:50 Invited Talk	From Model-Driven to LLM-Augmented Intelligence: Taking trajectory Optimization as Examples **Assoc. Prof. Pengfei Sun, Southwest Jiaotong University, China**
13:50~14:10 Invited Talk	Study on the Growth Trend of Hook-type Crack in the Rail Crown of Heavy-haul Railway **Asst. Prof. Junpeng Li, Hefei University, China**
14:10~14:20 TT593	Modeling Passenger Loyalty with Light Rail Transit Using Artificial Neural Network: A Case Study of Klang Valley, Malaysia **Ahmad Nazrul Hakimi Ibrahim, Universiti Kebangsaan Malaysia, Malaysia**
14:20~14:30 TT703-A	Study on mechanism of biburst mode in femtosecond laser ablation through in-situ monitoring **HengFeng Yang, Shanghai Jiaotong University, China**
14:30~14:40 TT712	Design and Validation of an Automated Venturi-Based Foam Fire Suppression System for Oil Storage Tanks **Abdulrahman Alamri, Prince Mohammad bin Fahd University, Saudi Arabia**
14:40~14:50 TT605	Behind the Wheel: How Demographics and Driving Predict Risk Outcomes Among Malaysian Express Bus Drivers? **Muhamad Nazri Borhan, Universiti Kebangsaan Malaysia, Malaysia**
14:50~15:00 TT713	Optimization Analysis of Interference Fit for Internal and external Gear Sleeves in Variable Gauge Wheelsets **Yan Chen, Chongqing Business Vocational College, China**

POSTER SESSION

SATURDAY, DECEMBER 20, 2025 <13:30~16:00> | **<5F Corridor 序厅>**

Session Title: Collaborative Optimization of Multimodal Transport System, Modeling of Traffic Behavior and Safe Operation

Chairperson: Prof. Yi Liu, Wuhan University of Technology, China

1 TT556	Research on China's Strategies for Responding to the IMO's Near-Zero Emission Framework **Yi Zhang, Tianjin Research Institute for Water Transport Engineering, Ministry of Transport, China**
2 TT589	Pedestrian Streamline Network Creation in Urban Rail Transit Stations **Bin He, Hebei Jiaotong Vocational and Technical College, China**
3 TT547	Multimodal Transport Routes Optimization Based on Genetic Algorithm **Rui Qiao, Research Institute of Highway Ministry of Transport, China**
4 TT594	A Method for Identifying Unsafe Behaviours in Ship Personnel Using Integrated Dynamic and Static Features **Jiaxin Li, Wuhan University of Technology, China**
5 TT620	Integrating STPA and Event-B for safety verification of key control logic in MASS operational systems **Ruiwen Zhang, Dalian Maritime University, China**
6 TT5002	Research on Automatic Review Method of Rail Transit Engineering Design Scheme **Jianbo Guan, Ningbo One Card Technology Co., Ltd, China**
7 TT5003	Investigating the energy import network resilience by considering maritime transportation disruptions **Yulan Zhao, Dalian Maritime University, China**
8 TT544	Ship-DETR: Advancing Inland Waterway Vessel Detection in Complex Environments **Jiayi Shen, Wuhan University of Technology, China**
9 TT716	Stability Assessment for Paralleled Grid-Forming Converters Based on Virtual Impedance with Wide Range of Connection Impedance **Kai Sun, Radar NCO School of Air Force Early Warning Academy, China**
10 TT539	AMLP-GCN Mixer: A Spatio-Temporal Interaction-Aware Model for Multi-Ship Behavior Prediction **Yuqing Wang, Wuhan University of Technology, China**
11 TT705	An Adjustable quasi-zero Stiffness Vibration Isolator Based on Euler Beam Buckling **Jiale Zhang, Shanghai University, China**
12 TT643	Mechanism – Data Hybrid Driven Forecasting of Ship Maneuvering Motion **Naifeng Zhang, Wuhan University of Technology, China**
13 TT633	Cross-Subject Takeover Performance Prediction Research Based on EEG and ECG **Zixu Wang, Shenzhen University, China**

14 TT528	Optimisation of Ship Scheduling in Two-Way Navigable Ports with Consideration of Carbon Emissions **Huanze Xiong, Wuhan University of Technology, China**
15 TT527	Research on Path Planning for Inland Waterway Unmanned Ships Based on an Improved NSGA-II Algorithm **Aodi Wu, Wuhan University of Technology, China**
16 TT531	Examining Interactions between Traffic Flow Features， Risky Driving Behaviors， and Traffic Crashes: A Multivariate Time Series Model **Zetao Wei, Beijing University of Technology, China**
17 TT526	Ship Scheduling Optimization in Coastal Channels Based on a Theil Index Satisfaction Model and Adaptive Optimization Algorithm **Yuan Xiang, Wuhan University of Technology, China**
18 TT572	A Train Self-decision Method for Train Regulation of Urban Rail Transit Lines **Jingzhong He, Southwest Jiaotong University, China**
19 TT5006	Adaptive trajectory tracking control of unmanned ship based on PPO-PID controller **Lei Du, Wuhan University of Technology, China**
20 TT621	A Multi-Feature Fusion Model for Waterway Traffic Flow Prediction **Ting Wang, Dalian Maritime University, China**

SPECIAL SESSION 3

SATURDAY, DECEMBER 20, 2025 <16:00~18:30> | **<5F Shahu Hall 沙湖厅>**

Session Title: Next Generation Autonomous Transportation Systems

Chairperson: Prof. Yong Ma, School of Navigation, Wuhan University of Technology, China

16:00~16:20 Invited Talk	Simulation Modeling and Analysis of Vessel Traffic in Busy Waters **Prof. Yi Liu, Wuhan University of Technology, China**
16:20~16:30 TT521	Named Entity Recognition of Port State Control Knowledge for LNG Carriers Based on the Share_RoBERTa-resBiLSTM-Att-CRF Model **Yu Zhong, Wuhan University of Technology, China**
16:30~16:40 TT645	Multi-Objective optimization for Heavy-Haul Train Operation Based on MISOCP **Dongxu Xiang, Southwest Jiaotong University, China**
16:40~16:50 TT657	Metocean Data Fusion and Visualization in ECDIS Using NetCDF Structured Datasets **Kaidi Li, Wuhan University of Technology, China**
16:50~17:00 TT602	Research on scheduling optimization of shared electric bicycles in historic urban districts **Xingyang Bian, Yangzhou University, China**
17:00~17:10 TT655	Ship Detection via multi-feature fusion of PointPillars **Shenyi Gong, Wuhan University of Technology, China**
17:10~17:20 TT662	Inland River AtoN Positioning and Ranging Based on Binocular Vision **Zihan Wang, Wuhan University of Technology, China**
17:20~17:30 TT550	Research on Buoy Drift Prediction Based on Multi-dimensional Feature Optimization and Deep Temporal Modeling **Hui Li, Wuhan University of Technology, China**
17:30~17:40 TT664	Modeling the Behavior of Inland Ships Based on Random Forest Method **Zhengguo Wu, Wuhan University of Technology, China**
17:40~17:50 TT663	Research on Near-Zero Carbon Container Terminals Based on the LEAP Model **Wei Wei, Wuhan University of Technology, China**
17:50~18:00 TT665	Research on Near-Shore Ship Emission Dispersion with CFD simulations **Yijian Lan, Wuhan University of Technology, China**
18:00~18:10 TT537	Local Path Planning for Ferry Based on Integrated Artificial Potential Field and Deep Q-Network Algorithms **Kaihong Yu, Wuhan University of Technology, China**
18:10~18:20 TT654	Application of an Enhanced RRT Algorithm in Path Optimization for LNG Vessel Night Navigation in Port Areas **Wenxue Zhang, Wuhan University of Technology, China**
18:20~18:30 TT617	Analysis of Intelligent Ship Technology Innovation from the Perspective of Text Mining and Patent Metrology Integration: A Case Study of Wuhan University of Technology **Yun Feng, Wuhan University of Technology, China**

SPECIAL SESSION 4

SATURDAY, DECEMBER 20, 2025 <16:00~18:20> | **<5F Changjiang Hall 长江厅>**

Session Title: Autonomous Perception and Decision-Making Control for Multiple Carriers under the Three-Dimensional Transportation

Chairperson: Prof. Zhouhua Peng, Dalian Maritime University, China

16:00~16:20 Invited Talk	EEG-based Assessment of Driver Trust **Assoc. Prof. Tingru Zhang, Shenzhen University, China**
16:20~16:30 TT644	Parallel automatic berthing control of maritime automatous surface ships via data-driven neural predictor **Zhouhua Peng, Dalian Maritime University, China**
16:30~16:40 TT535	Research and Translation on a Multi-disciplinary Coupled Simulation Platform for Quality Analysis of Heavy-haul Train Operations **Songsong He, Southwest Jiaotong University, China**
16:40~16:50 TT624	High Resolution Modeling of Typhoon Waves during Rapid Intensification for Ship Anchor Dragging Calculation **Jingsheng Cheng, Wuhan University of Technology, China**
16:50~17:00 TT628	A robust mixed integer model for roll on roll off ferry scheduling under demand uncertainty with heterogeneous emission rates **Ying Xie, Cranfield University, UK**
17:00~17:10 TT551	TrajDiT: Diffusion Transformer for Sequence-Aware Trajectory Generation **Jiongxu Chen, Sun Yet-sen University, China**
17:10~17:20 TT564	FormerLight: Coordinated Traffic Signal Control with Sequence-to-Sequence Model for Traffic Prediction **Hooi Ling Khoo, Universiti Tunku Abdul Rahman, Malaysia**
17:20~17:30 TT536	A Proprietary Parameter Identification Method for a Refined Train Air Braking Model **Sijie Xu, Southwest Jiaotong University, China**
17:30~17:40 TT625	An Integrated Framework for Detection and Geolocation of Traffic Anomalies in Highway Surveillance Videos **Xiaoliang Tan, Wuhan University, China**
17:40~17:50 TT610	Research on the Green Evaluation Index System for Transportation Infrastructure Construction Projects **Cheng Lu, Chang'an University, China**
17:50~18:00 TT507	The Evaluation and Spatiotemporal Evolution Analysis of the Transportation Development Level at the Provincial regions in China **Yifan Huang, China Academy of Transportation Sciences, China**
18:00~18:10 TT634	Deep Learning and Transfer Learning for Short-Term Traffic Forecasting: Insights from Perth, Australia **Chunliang Wu, University of Western Australia, Australia**
18:10~18:20 TT5004	A Novel Ship Detection Method for Inland Waterways Based on RDW-YOLOv11 **Lihong Li, Wuhan University of Technology, China**

ON-SITE SESSION 6

SATURDAY, DECEMBER 20, 2025 <16:00~17:50> | **<5F Moshan Hall 磨山厅>**

Session Title: Motor Digital Twin Modeling, Adaptive Collaborative Control and Energy Management

Chairperson: Assoc. Prof. Yongli Zhu, Sun Yat-sen University, China

16:00~16:20 Invited Talk	Design, Analysis, and Development Technologies for CNC Manufacturing Equipment **Assoc. Prof. Xingang Yang, Xi'an University of Technology, China**
16:20~16:30 TT711	Multi Physics Thermal Simulation and Passage Optimization of a Permanent Magnet Synchronous Motor **Yongzhe Liu, Beijing Institute of Technology, China**
16:30~16:40 TT726	Frequency Selectivity Analysis and Parameter Tuning for Double LCL Wireless Power Transfer Systems **Yongli Zhu, Sun Yat-sen University, China**
16:40~16:50 TT720	An EKF-based algorithm for rapid extraction of the fundamental components of fault signals in power distribution networks **Yifei Chen, Hubei University of Technology, China**
16:50~17:00 TT718	An Adaptive Weighted Load Forecasting Approach Based on Wavelet Transform-BP Neural Network Model **Yuchen Fang, Zhejiang University, China**
17:00~17:10 TT723	Research on Key Technologies for Source Load Cooperative Optimal Design of Distributed Photovoltaic Systems in Coal Mining Enterprise **Xiaodong Li, Ordos Institute of Technology, Ordos, China**
17:10~17:20 TT719	A two-stage hierarchical optimal operation considering multiple uncertainties **Ruijin Qu, Zhejiang University, China**
17:20~17:30 TT724	Regulation Capability Assessment and Enhancement for Coordinated Renewable Energy and Storage Systems **Wang Tianyu, State Grid Zhejiang Electric Power Research Institute, China**
17:30~17:40 TT725	Electrical Design and Optimization of an Integrated Solar, Storage, and EV Charging Station for Campus Applications **Xiaodong Li, Ordos Institute of Technology, Ordos, China**
17:40~17:50 TT707	Development of a Self-Constructing Deep Neural Network Controller: A Case Study on Position Tracking Control of a Stepper Motor under Noisy Conditions **Siavash Kazemi, Karlsruhe Institute of Technology, Germany**

ONLINE SESSION 1

SUNDAY, DECEMBER 21, 2025 <9:30~11:40> | **Room A: 872 3076 0354**

Session Title: Optimization of Modern Intelligent Logistics System and Traffic Accident Management

Chairperson: Assoc. Prof. Meng Zhou, Sun Yet-sen University, China

9:30~9:40 TT608	Assessing the Effectiveness of Speed Bumps in Slowing Down Light Vehicles in Loja'S Urban Streets **Juan Palacios-Ortega, Universidad Técnica Particular de Loja, Ecuador**
9:40~9:50 TT516	Research on Water Traffic Safety Risk Prevention and Control Knowledge Base Platform Based on Large Language Model RAG **Yang Jinhao, China Waterborne Transport Research Institute, China**
9:50~10:00 TT631	Policy Selection for High-Stakes Reinforcement Learning: A Case Study in Aircraft Stall Recovery **Junqiu Wang, Chinese Aeronautical Establishment, China**
10:00~10:10 TT639	Predicting Maritime Accident Types with a Hybrid Machine Learning Approach: An Analysis of Chinese Accident Reports **Meng Zhang, Dalian Maritime University, China**
10:10~10:20 TT629	Research on an Activation Model for Emergency Lanes on Expressways **Xinhai Zhen, Xi'an University of Posts & Telecommunications, China**
10:20~10:30 TT542	Fault Detection Enhanced by LLM-based Knowledge Graph **Jingwen Liu, Tsinghua University, China**
10:30~10:40 TT615	Comparative Analysis of Car-Following Behaviour Across Different Countries Using Real Trajectory Data **Melaku Munye, Southwest Jiaotong University, China**
10:40~10:50 TT524	Research on transportation path optimization considering loading and unloading time of emergency materials **Xiao Lin, Xi'an University of Posts and Telecommunications, China**
10:50~11:00 TT559	Genetic Algorithm-Based Optimization Method for Train Marshalling Plan Formulation **Panyang Yu, Southwest Jiaotong University, China**
11:00~11:10 TT648	Intelligent scheduling method for trunk logistics transportation based on vehicular platoon driving **Xueqing Wang, North China University of Technology, China**
11:10~11:20 TT630	Modelling, Simulation and Validation of Locomotive System Aggregated and Distributed Dynamic Models **Andile Nqodi, University of South Africa, Florida, South Africa**
11:20~11:30 TT5007	Research on Intelligent Life Cycle Management of High-Speed Rail Infrastructure Operations **Yaoyao Wang, Institute of Computing Technologies, China Academy of Railway Sciences Corporation Limited, Beijing, China**
11:30~11:40 TT706	Design and Experimental Research on Retrofitting a Green Low-Carbon Ship Power System

	Jianfeng Gao, Tianjin Aids to Navigation Department of NGCN, China

ONLINE SESSION 2

SUNDAY, DECEMBER 21, 2025 <9:30~11:40> | **Room B: 838 8100 4833**

Session Title: Digital Intelligent Transportation Policy Analysis, Industry Services and Future Planning

Chairperson: Asst. Prof. Li-Wen Chen, ChaoYang University of Technology, Taiwan, China

9:30~9:40 TT557	Research on the Optimization of Express Packaging Recycling Network Scheduling Based on the Life Cycle Theory **Liu Yuwei, Xi'an University of Posts and Telecommunications, China**
9:40~9:50 TT583	Identification of Logistics Resilience Dimensions and Scale Development for Postal and Express Delivery Enterprises **Xiangyu Shen, Xi'an University of Posts and Telecommunications, China**
9:50~10:00 TT555	The Interplay Between Technology and Institutional Frameworks in Maritime Infrastructure Standardization Under the Belt and Road Initiative: A Case of Colombo Port City **Jiayan Yang, China Harbour Engineering Company Ltd., China**
10:00~10:10 TT603	Global Semiconductor Trade Networks and Their Transport Implications：A 2024 Network Analysis **Liujun Shan, Xi'an University of Posts and Telecommunications, China**
10:10~10:20 TT646	Research on the Paths to Resolving the Development Dilemmas of the Road Freight Industry **Xueran Wang, Research Institute of Highway, Ministry of Transport, China**
10:20~10:30 TT616	Configuring urban public transport service quality enhance to passenger satisfaction: A hybrid fsQCA investigation **Guoliang Qiao, Xi'an University of Posts and Telecommunications, China**
10:30~10:40 TT505	Peak CO2 Emissions Forecast for China's Waterway Transport Sector Using GDIM **Sai He, Xi'an University of Posts and Telecommunications, China**
10:40~10:50 TT504	Two-Stage Optimization of Emergency Supplies Warehouse Location Based on the NSGA-II Algorithm **Pengyu Tan, Xi'an University of Posts & Telecommunications, China**
10:50~11:00 TT582	Factors Influencing Technological Innovation Capability of Rail Transit Equipment Manufacturing Enterprises under Digital Empowerment **QI Mancang, Xi'an University of Posts & Telecommunications, China**
11:00~11:10 TT595	Research on the evolution of environmental protection strategies of logistics and transportation companies with the participation of the government **Yuhong Cheng, Xi'an University of Posts and Telecommunications, China**
11:10~11:20 TT637	An Evolutionary Game Study of Technology Sharing and Resource Coordination in Transportation Enterprises under Dual Carbon Policy **Jie Wang, Xi'an University of Posts and Telecommunications, China**
11:20~11:30 TT573	Development Suggestions for the Small and Micro Passenger Car Rental Industry Based on Consumer Demand **Mo ZHANG, Research Institute of Highway Ministry of Transport, China**

11:30~11:40 TT715	Design and test of a deployable robot based on SLPM **Yukai Xiao, Shanghai University, China**

ONLINE SESSION 3

SUNDAY, DECEMBER 21, 2025 <13:30~15:40> | **Room A: 872 3076 0354**

Session Title: Collaborative Control and Scheduling of Multiple Transportation Modes in Intelligent Transportation Networks

Chairperson: Dr. Chunliang Wu, University of Western Australia, Australia

13:30~13:40 TT517	Freight Corridor Classification and Operational Efficiency Evaluation Based on Traffic Big Data: A Case Study in Guangdong, China **Yutian Gao, Guangdong Communication Planning & Design Institute Group Co., Ltd, China**
13:40~13:50 TT548	Vulnerability Analysis of Shipping Network Based on Improved Cascading Failure **Jinbiao Zhang, Wuhan University of Technology, China**
13:50~14:00 TT558	Optimization of Arrival and Departure Track in Heavy Haul Railways Considering Compatibility **Wenqing Wu, Southwest Jiaotong University, China**
14:00~14:10 TT599	Evaluation of Node Importance in Aviation Networks Based on the IKS-B Algorithm **Gonghao Wang, Xi'an University of Posts and Telecommunications, China**
14:10~14:20 TT501	Towards Personalized Prediction of Drivers' Trust in Intelligent Driving with Eye Movement and Individual Characteristics **Rongrong Ding, Institute of Human Factors and Ergonomics, Shenzhen University, China**
14:20~14:30 TT600	Topological Analysis of Hazardous Materials Transportation Network in Xi'an Based on Complex Network Theory **Kaiyu Huang, Xi'an University of Posts and Telecommunications, China**
14:30~14:40 TT590	Research on Intelligent Compilation of Train Disassembly Shunting Hook Plan Based on Improved PPO at the Marshalling Station **Yuanli Bao, Southwest Jiaotong University, China**
14:40~14:50 TT601	Enhancing Resilience of Transportation–Supply Chain Coupled Systems - A Redundant Capacity–Topology Co-Optimization Model and Empirical Study **Taiyi Zhang, Xi'an University of Posts and Telecommunications, China**
14:50~15:00 TT518	A Study on Geographic Grid Encode Based on Port and Maritime Big Data **Jun Huang, Transport Planning and Research Institute, Ministry of Transport, China**
15:00~15:10 TT529	Railway Signal Relay Circuit Simulation Using Directed Graph and Maze-Based Pathfinding **ZhiJiang Zheng, Southwest Jiaotong University, China**
15:10~15:20 TT649	Trajectory Tracking Control Method for Low-speed Unmanned Vehicle Based on Deep Reinforcement Learning **HongYong Zang, North China University of Technology, China**
15:20~15:30 TT732	Enhanced Take-off and Landing Performance of Light Aircraft and Large UAVs with Variable-Incidence Wings **Nikolai N. Kokin, Novus Converged Aerospace Ltd., UK**

15:30~15:40 TT636	Bilevel Programming about Facility Location Problem and Location Routing Problem via Logic-Based Benders Decomposition **Xuanjun Chen, Fuzhou University, China**

ONLINE SESSION 4

SUNDAY, DECEMBER 21, 2025 <13:30~15:40> | **Room B: 838 8100 4833**

Session Title: Infrastructure Status Monitoring and Traffic Environment Perception Analysis

Chairperson: Dr. Yujiao Zhao, University of Jinan, China

13:30~13:40 TT532	Remaining Useful Life Prediction for Railway Switch Machines Based on Agglomerative Hierarchical Clustering and Multi-Feature Fusion **Qifu Chen, Southwest Jiaotong University, China**
13:40~13:50 TT580	A Hybrid Mechanism- and Data-Driven method for Fault Diagnosis of High-Speed Train Axle-Box Bearings **Yulong Liu, Xi'an University of Posts and Telecommunications, China**
13:50~14:00 TT613	Exploration of the Application of Intelligent Operation and Maintenance System on Dalian Metro Vehicles **Yilin Yu, Dalian Metro Operation Co., Ltd., China**
14:00~14:10 TT714	Modeling and Simulation of Cable Joints Considering Contact Resistance **Xiaobin Mei, South China University of Technology, China**
14:10~14:20 TT597	A Method for Estimating the Maximum Parking Demand in Urban Areas Based on Multi-source Data **Xiaolan Zhang, Guangdong Polytechnic of Industry and Commerce, China**
14:20~14:30 TT519	Bus OD Matrix Estimation by IPF with LSTM-Generated Seed Matrix **Suhao Lu, Chongqing University of Posts and Telecommunications, China**
14:30~14:40 TT562	Research on Short-Term Highway Traffic Flow Prediction Method Based on Kernel-KNN in Special Environments **Long Cheng, Shijiazhuang Highway and Bridge Construction Group Co., Ltd., China**
14:40~14:50 TT566	Research on the Application of Machine Learning Algorithms in Vessel Traffic Flow Prediction **Zheng Guixiang, China Waterborne Transport Research Institute, China**
14:50~15:00 TT632	Application Research on Traffic Operation State Monitoring and Management-Control Platform for Expressway Reconstruction and Expansion Sections **Siyuan Hao, Research Institute of Highway Ministry of Transport, China**
15:00~15:10 TT647	Multi-Objective Optimization Study on an Economic-Environmentally Sustainable Route Network Considering Accessibility Equity **Cheng Yedan, Nanjing University of Aeronautics and Astronautics, China**
15:10~15:20 TT563	Research on urban traffic flow prediction based on BiLSTM-CAM model optimized by HFOA **Jixiao Jiang, Don State Technical University, Russia**
15:20~15:30 TT710	Hot-Spot Stress Evaluation of Transformer Tank Welded Joints Using Finite Element Analysis **Kerim Kaplan, Eltaş Transformatör A.Ş., Turkey**

15:30~15:40 TT717	Dynamic analysis of cage in double row angular contact ball bearings **Kai Wang, Xi'an University of Technology, China**

LIST OF DELEGATE

Xuxin Zhang, Shenzhen Polytechnic University, China
Fan LI, Hong Kong Polytechnic University, Hong Kong, China
Yujiao Zhao, University of Jinan, China

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