The 3rd IEEE International Conference on Automation in Manufacturing, Transportation and Logistics (iCaMaL2023)

第三届 IEEE 制造、交通与物流自动化国际学术会议

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程序册（Program）

Nov.3-5, 2023, Wuhan, China

2023 年 11 月 3-5 日 中国武汉

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CONFERENCE PROGRAM（大会议程）

Friday, November 3, 2023

Time	Activity*(Place)*
15:00 – 20:00	**Registration (*Wuhan Iron and Steel Hotel/武钢宾馆*)**
19:00-21:00	**Reception Dinner**

Saturday, November 4, 2023

Time	Activity*(Place: Campus of Yujiatou/余家头校区)*
08:30 – 12:00	**Registration** (*Assembly Hall/大礼堂*)
08:30 – 09:00	**Opening Ceremony** (*Assembly Hall/大礼堂*) **Chair**：Di Zhang
09:00 – 09:10	**Group Photo**
09:10 – 12:00	**Keynote Speech** (*Assembly Hall/大礼堂*)
Chair: **Prof.** **Weiming Shen**	Automation in Port Container Terminals Prof. Kap Hwan Kim, Pusan National University, Academician of Korea
	Intelligent Operation and PHM of Industrial Systems Prof. Mingjian Zuo, University of Alberta, Academician of Canada
10:10 – 10:30	**Coffee/Tea Break**
Chair: **Prof.** **Chengqing Yuan**	Data-driven risk analysis in container supply chains Prof. Zaili Yang, Liverpool John Moores University, UK
	The Impact of Covid-19 on the Australian Aviation Industry Prof. Gabriel Lodewijks, The University of Newcastle, Australia
	Research Development of Optimization Scheduling for Smart Manufacturing and Service Prof. Ling Wang, Tsinghua University, China
12:00 – 13:30	**Lunch**

13:30 – 18:00	**Registration (School of Transportation and Logistics Engineering /交通与物流工程学院)**
13:30 – 14:20	**Invited Speech(*Lecture Hall/报告厅*)**
Chair: **Prof. Meng Yu**	Challenges of Science and Technologies in Bulk Solids Handling towards Smart and Green Bulk Ports Prof. Xiangwei Liu, Shanghai Maritime University
	A Power Consumption Prediction Method Considering Time Lag Between Server and Cooling Equipment for Green Data Center Dr. Jingtao Sun, Research & Development, Hitachi, Ltd., Japan
	Sessions(School of Transportation and Logistics Engineering /交通与物流工程学院)
14:30 – 16:00	**BP1: Best Paper(*218*)**
	BP2: Best Paper(*308*)
	OS: Optimization and Scheduling (*208*)

	SM1: Simulation and Modeling (*212*)
	MA1: Mechanical Systems and Advanced Manufacturing Technologies (*202*)
	OT1: Optimization of Aviation Logistics and Traffic Organization Mode (*204*)
16:00 – 16:20	**Coffee/Tea Break**
16:20 – 17:50	**BP3: Best Paper** (*218*)
	SC1: Sensing, Control and Robotics (*308*)
	LM: Logistics Operational Control in Manufacturing (*208*)
	SM2: Simulation and Modeling (*212*)
	MA2: Mechanical Systems and Advanced Manufacturing Technologies (*202*)
	OT2: Optimization of Aviation Logistics and Traffic Organization Mode (*204*)
18:00 – 18:20	**Transfer to Hotel**
19:00 – 21:00	**Conference Banquet**

Sunday, November 5, 2023

Time	**Activity** *(Place: Campus of Yujiatou/余家头校区)*
9:00 – 11:50	**Keynote Speech** (*Assembly Hall/大礼堂*)
Chair: Prof. Wu Ouyang	Urban Traffic Physical Examination System Based on Digitalization and Informatization and Its Application Prof. Xiaoguang Yang, Tongji University, China
	Analysis of the Activities of High Sea Fishing Vessels from China, Japan, and Korea via AIS Data Mining Prof. Zhongzhen Yang, Ningbo University, China
	Machine Learning and Big Data Analytics for Sustainable Food-Energy-Water Nexus Prof. Xiaoou Li, Computer Science Department at CINVESTAV-IPN, Mexico
10:30 – 10:50	**Coffee/Tea Break**
Chair: Prof. Xiaohua Cao	MP/CP Based Optimization Framework and Applications on APS of Steel Production Processes Prof. Shixin Liu, Northeastern University
	Reinforcement learning enhanced autonomous mobile robots coordination Prof. Ning Zhao, Beijing University of Science and Technology, China
11:50 – 12:20	**Award Ceremony**
12:30 – 13:30	**Lunch**

TECHNICAL PRESENTATION（论文宣读与学术交流）

Session BP1: Best Paper Session1
Chair: Prof. Xiuwen Fu, Prof. Yaqiong Lv
Time: November 4, 2023, Saturday, 14:30 – 16:00
Venue: 218

PAPER ID	PRESENTATION
20	Yuanhao liu, Zan Yang, Danyang Xu, Haobo Qiu and Liang Gao. A Novel Surrogate-assisted Differential Evolution for Mixed-integer Expensive Constrained Optimization Problems
81	Yangjun Sun, Ning Zhao, Longwei Tang and Luo Lei. A Centralized Scheduling Strategy in a Robotic Mobile Fulfillment System for Increasing the Optimal Number of Robots
23	Ying Huang, Zhihong Jin, Xiaohan Wang, Dacosta Essel, Jiaxin Cai ,and Cuijie Diao. A model of the container drayage problem with appointment system and separation mode
34	Chen Sheng and Qiang Wang. Hybrid Mechanism-Data-Driven Method for Energy Consumption Estimation Model of Shore Bridge
75	Fangfang Zhang, Mengdie Duan, Peng Bo Zhao and Jianbin Xin. Mutli-Robot path optimization based on DMPC

Session BP2: Best Paper Session2
Chair: Prof. Junliang Wang,   Prof. Kaixiong Hu
Time: November 4, 2023, Saturday, 14:30 – 16:00
Venue: 308

PAPER ID	PRESENTATION
36	Yue Su, Liang Qi, MengChu Zhou and Remigiusz Wiśniewski. A Reachability-decidable Petri Net Modeling Method and its Application to Flexible Manufacturing Systems
63	Jing Zhou and Haili Li. Research on ceramic 3D printing surface defect detection system based on machine vision
55	Huifang Li, Mingtong Du, Boyuan Chen, Xiangyu Lu, Sencun Chai and Yuanqing Xia. Hybrid Optimization for Scheduling Budget-constrained Energy-aware Workflows in the Cloud
40	Qiang Zhang. Lateral and Longitudinal Hierarchical Control of Port AGV Path Tracking based on MPC and SMC
47	Yangming Zhou, Yong Li, Lei Wang, Wenqiang Xu and Mengchu Zhou. A Hybrid Evolutionary Algorithm for Workload-Balanced Colored Traveling Salesman Problem

Session BP3: Best Paper Session3
Chair: Prof. Jiahe Shen, Dr. Gao Wan
Time: November 4, 2023, Saturday, 16:20 – 17:50
Venue: 218

PAPER ID	PRESENTATION
61	Zhongkai Li and Quanke Pan. Parallel IG Algorithm for Matrix Shop AGV Scheduling Problem with Time and Capacity Constraints
37	Yao Gao and Xiaolei Liang. Modeling and Simulation of Lock Scheduling considering with Ship Type Standardization for Three Gorges-Gezhouba Dam Cascade Hub
46	Hao Dou, Dan You, Shouguang Wang, Mengchu Zhou, and Wei Liu. Synthesizing Liveness-enforcing Supervisors of Automated Manufacturing Systems via Maximal Good Step Graphs of Petri Net Models
65	Yeming Zhu, E Cheng, Zhengyan Zhang, Fan Bu, Zhi Han and Yuhang Liu. Fabrication of microscale silver conductive structures by electric field-driven direct writing
58	Xiao Mei and Wenju Yao. Liner Wear of Large-scale SAG Mill Based on DEM Analysis

Session OS: Optimization and Scheduling
Chair: Prof. Yanyan Wang, Dr. Li Yin
Time: November 4, 2023, Saturday, 14:30 – 16:00
Venue: 208

PAPER ID	PRESENTATION
2	Yanyan Wang, Xurui Ma, Jinning Qin and Shandong Mou. Research on Task Scheduling Algorithm of Shuttle based Storage and Retrieval System Based on Energy Consumption
19	Li Yin, Guojin Li, Shuxuan Zhao, Wennan Zhang, Ray Y. Zhong and Junliang Wang. A Scenario-Based Synchronization Framework for Construction Logistics Scheduling in Urban Areas
89	Bencheng Luo, Ruodi Wang, Jia Hu and Tengfei Wang. Evaluation Model of Smart Port Index Based on Gray Entropy Variable Weight
33	Weihua Gan,Yanan Liu and Shuying Huang. Regional Differences and Convergence Analysis of Logistics Industry's Green Welfare Effects in China
54	Yanlong Zhong, zhengguo wang and xiaolong Xu. Research on the Configuration of AS/RS Warehouse System Based on AGV Transportation
52	Ziyan Zhao, Junzhi Cheng, Ziyao Fan, Jiaqi Liang and Shixin Liu. Human-Robot Collaborative Picking Optimization in Robotic Mobile Fulfillment Systems
74	Jianbin Xin, Quan Yuan and Fangfang Zhang. Dynamic path planning of multiple warehouse AGVs based on improved time-space network model

Session LM: Logistics Operational Control in Manufacturing
Chair: Prof. Jianbin Xin, Dr. Yifan Li
Time: November 4, 2023, Saturday, 16:20 – 17:50
Venue: 208

PAPER ID	PRESENTATION
44	Haiqiang Hao, Haiping Zhu, Guohui Zhen and Liezheng Shen. A Hybrid Algorithm for a Flexible Resource-constrained Multi-project Assembly Scheduling Problem
80	Youjie Yao, Cuiyu Wang, Xinyu Li and Liang Gao. Energy-Efficient Job Shop Scheduling Problem with Finite Transportation Resources and Set-up Time
42	Bin Zhan and Jia Li. Analysis of Operation Modes and Equipment Configuration in U-shaped Sea-Rail Intermodal Port using AnyLogic Simulation
24	Xiaoshuang Tan, Jiaqi Yang. Research on the Selection of Transportation Mode and Route Optimization for Cruise Ship Construction Materials
41	JianYong Lv, Bo Huang and Xiaoyu Lu. A Petri Net-based Anytime Scheduling Method for Robotic Cellular Manufacturing Systems
6	Ying Huang and Shixin Liu. Variable Neighborhood Search for Scheduling of Cold Rolling Annealing Process of Silicon Steel

Session SM1: Simulation and Modeling1
Chair: Dr. Shijie Li, Dr. Guosen Li
Time: November 4, 2023, Saturday, 14:30 – 16:00
Venue: 212

PAPER ID	PRESENTATION
71	Shuaihan Bao. Dynamic Analysis of Variable Cross-section Quayside Container Crane Beams Based on Improved Vector-based Finite Element Method
28	Junjie Wang, Heng Huang , Chuanjie Zhang and Yu Zhang. Simulation Analysis of Dynamic Scheduling for Uncertain Tasks in Automated Container Terminal
59	Xiao Mei, Yuan Tian and Xiangwei Liu. The Internal Flow Field Analysis of the Ultrafine Pulverizer based on Fluent and the Experiment of Material Classification
60	Xiao Mei, Weirong Wu and Xiangwei Liu. Research on discrete element parameter calibration of coal based on similarity theory
67	Chenyang Zhang and Mengchu Zhou. A Review of Pallet Loading Problem with Formulations and Solutions
5	Jianling Chen and Jie Lu. Study on The Ecological Evolution of Logistics Industry Cluster in The Yellow River Basin

Session SM2: Simulation and Modeling2

Chair: Prof. Xiaolei Liang, Dr. Lingcong Zhong
Time: November 4, 2023, Saturday, 16:20 – 17:50
Venue: 212

PAPER ID	PRESENTATION
72	Xiong Yin, Yulian Cao, Bo Huang, Bolong Li, Xiaoming Wang and Daojin Yao. Path Planning of Mobile Robot Based on Improved A*_TEB Algorithm
77	Wenfeng Li, Ziteng Wu, Lei Cai and Wenjing Guo. Analysis of Operation Modes and Equipment Configuration in U-shaped Sea-Rail Intermodal Port using AnyLogic Simulation
78	Wenfeng Li, Huixian Fan, Lei Cai and Wenjing Guo. Simulation-based Multi-Equipment Integrated Scheduling for a U-shaped Container Terminal Considering Uncertain Operation Times
73	Qijiang Su and Hui Wu. Path Planning for Power Inspection Robot Based on Improved Particle Swarm Algorithm and Dynamic Window Approach
70	Hao Shi, Yue Liu, Yuan Zhang, Cheng Quan Hu, Hong Gang Liu , Chen Zhang and Xin Chang. Analysis and Experimental Research on Contact force of the Idler Group of Pipe Belt Conveyor
7	Weiping Sun and Shixin Liu. Genetic Algorithm for Scheduling of Steelmaking and Continuous Casting Processes Considering Earliness/Tardiness Penalty

Session MA1: Mechanical Systems and Advanced Manufacturing Technologies1

Chair: Prof. Zhengyan Zhang, Dr. Qiang Zhang
Time: November 4, 2023, Saturday, 14:30 – 16:00
Venue: 202

PAPER ID	PRESENTATION
83	YiMing Lai, ChunRong Pan and Yan Qiao. Performance Analysis of Single-Robotic-Arm Cluster Tools with Uncertain Processing Time and Periodic Chamber Cleaning
68	Zhu Xiang, Jia Liu, Kewei Yang, Minghao Li, Zhiwei Yang and Mengjun Li. Digital Twin Workshop Architecture Design Based on UAF
82	Shuhao Yang, Xiangwei Liu and Derui Yuan. Research on the Friction Characteristics of Mechanical-hydraulic Hybrid Vertical Lifting System for Deep-sea Minerals
48	Liu Chao. Study on the diffuser structure for broadening flow width and numerical analysis in turbocharger centrifugal compressor
8	Hui Lin, Yi Zhu and Honghui Zhu. The Application of Real-Time Analysis of 3D Point Cloud Data in Safety Pre-Warning During the Construction of Mountain
66	Heke Chang. Five-axis multi-direction 3D printing slicing algorithm
92	Qilin Liu, Wu Ouyang, Zheng Zhaoli, Guangming Cao, Tao He. Theoretical and experimental research on the dynamic characteristics of full-size water lubricated stern bearing

Session MA2: Mechanical Systems and Advanced Manufacturing Technologies2
Chair: Prof. Jie Mei, Dr. Sheng Yuan
Time: November 4, 2023, Saturday, 16:20 – 17:50
Venue: 202

PAPER ID	PRESENTATION
86	Chengjun Xu, Peize Li and Yuke Ji. Feature Matching Research of Portal Crane Based on Improved QB-SHOT Feature Descriptor
87	Xiuwen Fu, Xiaojie Xu. Analysis on Cascading Failure Resilience of Automotive Manufacturing Supply Chain Networks Considering Node Roles
88	Xiaoling Guo, Yaqiong Lv. Intelligent Vibartion-Monitored Data-Driven Anomaly Detection for Rolling Bearings
90	Shun Wang and Heke Chang. Effect of Scanning Strategy on the Mechanical Properties of Honeycombs Fabricated by Selective Laser Melting of 316 L Stainless Steel
51	Chang Tian, Nan Du, Yan Yang, Zhongjiao Shi and Zhijie Liu. Hierarchical Deadlock Control of Automated Manufacturing Systems with Complex Structures
27	Jiajun Yang, Long Peng and Jiali Wang. Structural Parameter Optimization Design of Planetary Roller Screw Pair Based on Genetic Algorithm

Session SC1: Sensing, Control and Robotics1
Chair: Prof. Wentao Dong, Dr. Di Shi
Time: November 4, 2023, Saturday, 16:20 – 17:50
Venue: 308

PAPER ID	PRESENTATION
9	Zhiwang Mei and Yibin He. Research on Compliant Control of Manipulator in Human Body Massage
14	Tong Pang, Lin Yang, Giancarlo Fortino, Qing Yang, Xin Yang and Claudio Savaglio. Human-centric Interoperability Method for Greenhouse Digital Twins in Metaverse era
10	Yapeng Wang, Di Shi and Yunhai Geng. Adaptive Control of a Cable-driven Ankle Exoskeleton Robot for Walking Assistance
39	Chi Deng, Mian Yan, Xianghao Kong, Jiarong Gao, Yibo Liu and Zhipeng Zhang. A BERT Model-based Approach for Causation Analysis of Electric Power Safety Accidents
50	Meng Yu, Zhibo Jin, Yuan Liu and Tengfei Wang. Multi-sensor-based Intelligent Monitoring System Design for Hazardous Materials Warehouse
4	Xiaopeng Qiu, Wenke Luo, Na Li, Qi Gao, Junrong Bao and Wentao Dong. Digital Track: Structural Health Monitoring for Track Based on Flexible Multi-functional Sensors
18	Xiong Yin, Qian Zhou, Ming Cheng, Wei Liu, Wentao Dong and Daojin Yao. Path Planning of Mobile Robot Based on Improved D* Lite_TEB Algorithm

Session OT1: Optimization of Aviation Logistics and Traffic Organization Mode1
Chair: Prof. Yanjie Zhou, Dr. Cong Gao
Time: November 4, 2023, Saturday, 14:30 – 16:00
Venue: 204

PAPER ID	PRESENTATION
53	Yuan Yuan, Jiawei Yu and Jia Ma. Aircraft Maintenance Routing Problem Model and Metaheuristic Algorithm
79	Hang Wang, Jiang Xu, Yanjie Zhou, Xuehao Feng. Three-dimensional Packing Problem with Variable Size Items
45	Gabriel Lodewijks. Autonomous Transport and Logistic Systems at Airports
56	Yuanzhen Sun, Liang Qi, Wenjing Luan and Fuxin Zhang. Large-Scale Traffic Signal Control Considering Pressure Based on Multi-Agent Q-Learning
11	Geru Hu and Qiang Zhou. Simulation Study of Throughput Capacity of Multi-berth and Less-loading-line Coal Terminal
32	Weihua Gan, Huixing Duan, Yupeng Li. Literature Review of Government Regulation of Online Freight Platform in China(2016-2022)
25	Yuping Xu, Zongyu Wang and Xiaomei Dong. An Empirical Analysis of the Synergistic Development of Port Logistics and Economy in Wuhu City Based on the VAR Model

Session OT2: Optimization of Aviation Logistics and Traffic Organization Mode2
Chair: Dr. Yulian Cao, Dr. Xin Li
Time: November 4, 2023, Saturday, 16:20 – 17:50
Venue: 204

PAPER ID	PRESENTATION
30	Xin Li. Research on Location Selection of Metropolitan Area Logistics Distribution Center Based on GIS and AHP
43	Bin Zhan, Jia Li, Zhong Wu and Xue Zhai. Macroscopic Traffic Model with Variable Optimal Density of Traffic Flow
62	Xuna Han, Jingjing Cao, Wei Zhang and Jianhua Chen. Technology Foresight Research of Key Technologies for Collaborative Development of Hainan Port Cluster
22	Xumao Li, Yujie Liu and Tao Li. Distribution of Cruise Ports in the Mediterranean Region: Spatial Heterogeneity and Influencing Factors
26	Zheyuan Mei, Yuping Xu and Yongwei Hu. Study on the Coupling Relationship Between Transport Infrastructure and Digital Economy in the Middle and Lower Reaches of Yangtze River

KEYNOTE/INVITED SPEAKERS

Prof. Kap Hwan Kim

Pusan National University

Academician of Korea

Kap-Hwan Kim is working at Ocean College of Zhejiang University. Before joining to Zhejiang University, he had worked at the Department of Industrial Engineering of Pusan National University. He studied at the Seoul National University (Bachelor) and the Korea Advanced Institute of Science and Technology (Master, Ph.D.). He was the director of the Institute of Logistics Innovation and Networking at Pusan National University and the president of the Korean Institute of Industrial Engineers. He is a fellow of the Korean Academy of Science and Technology. His research is focused on the design and operational problems of container terminals. He published many papers at international journals such as OR Spectrum, Flexible Services and Manufacturing Journal, Transportation Science, Transportation Research B, Transportation Research E, European journal of Operational Research, and so on.

Speech Title: Automation in Port Container Terminals

Abstract: Various types of equipment and facilities, which have been or are being used in port container terminals will be introduced. Logistics processes in various types of container handling systems will be overviewed. Historical progresses in the development of automated container terminals will be introduced. Types of automated terminals will be classified considering their handling equipment. In addition, their unique characteristics, and their advantages and disadvantages will be discussed. Main focus will be given to impacts of different layouts of the container storage yard on the performance of container terminals. Potential issues in design and operation related to each type of automated terminal will be proposed.

Prof. Mingjian Zuo

University of Alberta

Academician of Canada

Dr. Mingjian Zuo is Guest Professor of the University of Electronic Science and Technology of China, Professor of the University of Alberta Canada, and Chief Scientist of Qingdao International Academician Park Research Institute. His research interests include system reliability analysis, maintenance modeling and optimization, signal processing, fault diagnosis, and health management of engineering systems. He received the Master of Science degree in 1986 and the Ph.D. degree in 1989 both in Industrial Engineering from Iowa State University, Ames, Iowa, U.S.A. He served as Department Editor of IISE Transactions, Associate Editor of IEEE Transactions on Reliability, Associate Editor of Journal of Risk and Reliability, Associate Editor of International Journal of Quality, Reliability and Safety Engineering, Regional Editor of International Journal of Strategic Engineering Asset Management. He is Fellow of the Canadian Academy of Engineering, Fellow of the Institute of Industrial and Systems Engineers (IISE), Fellow of the Engineering Institute of Canada (EIC), and Founding Fellow of the International Society of Engineering Asset Management (ISEAM).

Speech Title: Intelligent Operation and PHM of Industrial Systems

Abstract: Industrial equipment systems are widely used in manufacturing, transportation, infrastructure, harbour, petrochemical, nuclear, and metallurgical industries. The safe, reliable, and economic operation of such systems are of paramount importance to our society. This talk will list the performance requirements of these systems including functionality, safety, reliability, and sustainability, introduce applications of intelligent operation in quality control, path planning, remote control, and dynamic production planning, and highlight the importance of Prognosis and Health Management (PHM) for value realization of industrial equipment. Finally, this talk will outline the setup of an Intelligent Operation & PHM (IOPHM) system possessing capabilities of data acquisition, data analysis, data mining, anomaly detection, fault diagnosis, prediction of equipment remaining useful life, and generation of optimal decisions for operation control, spare parts inventory management, maintenance personnel and task scheduling, and equipment life cycle management. Such an IOPHM system is essential for the safe, reliable, and sustainable operation and effective life cycle management of industrial systems.

Prof. Gabriel Lodewijks

PhD FRAeS, The University of Newcastle, Australia

After completing a PhD research project on dynamics of belt systems, such as moving sidewalks and escalators, Professor Lodewijks moved to the USA where he worked for a small engineering company as engineer special projects specializing in large scale transport systems. In 1999 he moved back to the Netherlands and was appointed professor of transport engineering and logistics at Delft University of Technology, the Netherlands in 2000. In 2003 he was appointed head of the school of marine and transport technology and later deputy dean of the faculty of mechanical, maritime and materials engineering. In 2007 he was appointed Chief Technology Officer of the Schiphol group, a company that operates airports around the world. In 2008 professor Lodewijks was appointed scientific director of the Delft Centre of Aviation. Besides being active at TU Delft, he works as visiting/guest/chair professor at the University of Witwatersrand, South Africa, Wuhan University of Technology, Beijing University of Science and Technology, China University of Mining and Technology, Nanjing University of Aeronautics and Astronautics, all in China, and UNSW Sydney, Australia. He is currently professor of Aerospace Systems at The University of Newcastle, Australia.

Gabriel Lodewijks areas of interest are logistics and transport engineering in the aerospace/aviation cluster. He works on problems associated with the optimization of maintenance, repair and overhaul processes, aircraft systems, automation of air cargo handling systems, improvement of the quality of the flower supply chain handled through air cargo, tracking and tracing of equipment, components and people at airports and in aviation related companies, optimization of gate processes and baggage handling procedures to reduce the turnaround time of aircraft, maintaining safety and security in airport logistic processes, and the improvement of passenger experience by streamlining airport logistics.

Speech Title: The Impact of Covid-19 on the Australian Aviation Industry

Abstract: In November 2019 the world changed forever. What originally seemed like a more or less isolated event, like the SARS pandemic, turned out to be a worldwide pandemic: COVID-19. With more and more countries restricting entrance, Australia, like New Zealand, decided to close the borders all together. This had a huge impact on transport and logistics, and in particular the aviation industry. This paper will discuss the impact of the COVID-19 pandemic during and after the closure of the Australian borders on the Australian Aviation Industry.

Prof. Zaili Yang

Liverpool John Moores University，UK

Zaili Yang is Professor of Maritime Transport and Co-Director of Liverpool, Logistics, Offshore and Marine Research Institute at Liverpool John Moores University (LJMU), UK. He received his BEng in Maritime Transportation from Dalian Maritime University, China, in 2001, MSc in International Transport from Cardiff University, UK, in 2003, and PhD in Maritime Safety from LJMU, UK, in 2006. Prof. Yang's research interests are analysis and modelling of safety, resilience and sustainability of transport networks, particularly maritime systems. Prof. Yang has received more than £7m external grants (£4m as the PI) from the EU and UK EPSRC, including a prestigious ERC consolidator grant. Prof. Yang has completed 10 postdoctoral and 37 PhD projects. He currently has 4 PDRAs and 10 PhD Students under his supervision in the research areas of maritime safety and logistics operations. His research findings have been published in over 350 refereed papers in risk and transport areas, including 200 long journal papers (WoS citation: 5400, H-index:43; Google citation:9000, H-index:52). Prof. Yang is the AE/EMB of 14 journals (e.g. Transport Research Part E). He has received 14 paper awards (e.g. IMechE Journal Part M) and 5 research awards (e.g. Northeast Asia Logistics Award 2018).

Speech Title: Data-driven risk analysis in container supply chains

Abstract: Risk research represents an important challenge for the resilience and sustainability of container supply chains (CSCs) due to climate change, terrorism threats and an increasing amount of economic upheaval in the past decade. Its foci are being expanded from classical safety, through security to climate adaptation areas. Addressing risks of different features requires integration across disciplines and across research methodologies. Currently, we lack the critical understanding of which kinds of risk schemes can most effectively harness science and technology for achieving long-term resilient and sustainable CSCs. This presentation aims at introducing a series of studies on data driven risk analysis which enables the quantification, integration and communication of risk information from different areas and facilitates the movement of risk culture from a traditional reactive single dimensional scheme towards a new proactive multiple dimensional regime. The work will address the significant methodological issues associated with resilience and sustainability sciences particularly with reference to risk analysis under high uncertainty.

Prof. Ling Wang

Tsinghua University Recipient of the Outstanding Youth Fund

Ling Wang received both B.Sc. and Ph.D. degrees from Tsinghua University in 1995 and 1999, and now is a tenured Full Professor with Tsinghua Univ. His research interests mainly include intelligent optimization, scheduling and applications. He has authored 5 academic books and more than 350 SCI-indexed papers. His publications have attracted over 30K Google Scholar Citations. He is the Editor-in-Chief of International J of Automation and Control, Complex System Modeling and Simulation, the Editor of Expert Systems with Applications, and the Associate Editor of IEEE Trans on Evolutionary Computation, Swarm and Evolutionary Computation, and the Editorial Board Member of Memetic Computing, Control Theory & Applications, Control and Decision, CIMS, System Engineering and Electronics, etc. Prof. Wang received National Natural Science Award of China (2nd Prize), Natural Science Award of the Ministry of Education of China (1st Prize and 2nd Prize), Science and Technology Awards of Beijing City, Yunnan Province and Hubei Province, Technology Innovation Award (1st Prize) and Natural Science Award (1st Prize) of China Simulation Federation. He also received the INFORMS Franz Edelman Finalist Award, the Top Cited Article Award of EAAI (Elsevier) as well as the Best Paper Awards of Acta Automatica Sinica, Control Theory & Applications, Control and Decision, J of System Simulation and several International Conferences. He was the recipient of National Natural Science Fund for Distinguished Young Scholars of China (2015), Young Talent of Science and Technology of Beijing City, New Century Excellent Talent in University by the MOE of China, Academic Young Talent of Tsinghua University, Young Scientist Award of CAA, Chinese Most Cited Researcher (2019~2023), IEEE TEVC Outstanding Associate Editor (2019~2023).

Speech Title: Research Development of Optimization Scheduling for Smart Manufacturing and Service

Abstract: In this talk I will first introduce the background and significance of the research about optimization scheduling for manufacturing and service systems, and then explain the classification and challenges on the research about optimization. Finally I will point out the important issues and development directions about optimization and scheduling based on several application fields and scenarios.

Prof. Xiaoguang Yang

Tongji University

Dr. Xiaoguang Yang is Second level professor/doctoral supervisor at Tongji University, one of the main leaders of the national key discipline "Transportation Planning and Management/Traffic Information Engineering and Control", Director of the Intelligent Transport System (ITS) Research Center at Tongji University, and director of the Traffic Safety Research Office of the Shanghai Institute of Disaster Prevention and Relief, who established the "Traffic Design Theory and Method System"; Created research and application on China's "Vehicle Road Networking and Collaborative Traffic Control System" and "Traffic Engineering 2.0, Traffic Health Analysis and Intelligent Diagnosis System, Multimodal Traffic Collaborative Control/Management/Service/Decision Integration"; One of the main implementers of China's first independently developed "urban traffic real-time adaptive control system"; Enjoying special allowances from the State Council, selected as the first tier of the "New Century Hundred Thousand Talents Project" by the Ministry of Transport, a leading talent in Shanghai, and the person of the year for China's intelligent transportation in 2021. Also serving as the Chairman of the Teaching Guidance Subcommittee for Transportation Engineering in Higher Education Institutions of the Ministry of Education of China.

Speech Title: Urban Traffic Physical Examination System Based on Digitalization and Informatization and Its Application

Abstract: With the rapid motorization of urban transportation and the constraints of urban land spatial resources, traffic congestion, traffic accidents, traffic energy consumption and pollution, and low efficiency have become increasingly acute "traffic diseases", which have become the main focus of "urban diseases". This speech will focus on analyzing and calculating urban road traffic health characteristic indicators based on basic data related to city and transportation, as well as the construction method of urban traffic examination system, And through practical applications, it has been proven that the results of this study have key fundamental significance and practical value in improving urban transportation.

Prof. Zhongzhen Yang

Ningbo University

Dr. Yang is a professor of Maritime and transportation, Ningbo University, a member of Academic Degrees Committee of the State Council of China during 2010-2020. Editorial board member of international journals of Transport Policy, and Maritime Economics and Logistics.

Professor Yang has published 200 journal papers, with 1640 of cumulative citation frequency in WOS database and 21 of H-index, while the highest SCI citation of his single paper is 187 times. Professor Yang is a monograph author of book of 《Shopping Center location and its Traffic Impact assessment》, coauthors of three books of 《Research on the development Strategy of TOD and its application in Dalian》.

The main research fields and academic interests of Prof. Yang are: Land-use and transportation modeling; Maritime economics and management; Transportation demand analyses; Shipping network design; Port terminal operation and scheduling; Urban logistics.

Speech Title: Analysis of the Activities of High Sea Fishing Vessels from China, Japan, and Korea via AIS Data Mining

Abstract: In addition to offshore fishing, high sea fishing has become another important supply channel for seafood. The pelagic catches of China, Japan, and Korea (CJK) account for 60% of the global total, and an analysis of their activities adds essential clarity regarding global fishery resources. This paper develops a framework for analyzing the activities of HSF vessels based on satellite AIS data from 2019, which is used to study the spatial-temporal characteristics of the lengths, speeds, trajectories, and trajectory densities of HSF vessels, the numbers of active vessels, and their average fishing times. The analysis results show that: 1) Chinese HSF vessels are mostly small, relative to Japanese and Korean ships; 2) The speed of Japanese HSF vessels is consistently the highest; 3) All HSF vessels mainly fish in the Northwest Pacific, Western Central Pacific, Eastern Central Pacific, Southeast Pacific, Eastern Central Atlantic, Southeast Atlantic, and Western Indian Oceans; 4) The trajectory distribution of Chinese and Japanese vessels are similar, and both are more widely distributed than Korean vessels; 5) Chinese and Korean HSF vessels mostly enter the Atlantic through the Drake Passage, while Japanese ships mostly enter through the Panama Canal; 6) Chinese HSF vessels fish in Antarctic fisheries all year, while Korean ships aim to fish in Antarctic fisheries in the Spring, Summer, and Winter; 7) China has the largest number of HSF vessels in all fisheries, but their average fishing time is the shortest.

Computer Science department at CINVESTAV-IPN, Mexico

Dr. Xiaoou Li earned her B.S. in Applied Mathematics from Northeastern University, Shenyang, P.R. China, in 1991, and her Ph.D. in Automatic Control in 1995 from the same institution. She has been a Professor of Computer Science department at CINVESTAV-IPN, Mexico, since 2000. She was a Senior Research Fellow at Queen's University Belfast and University of California Santa Cruz in 2006 and 2010. Dr. Li is a regular member of the Mexican Academy of Science and a member of the National Researcher System of Mexico.

Dr. Li's research spans machine learning, sustainable automation, time series analysis, social networks, knowledge-based systems, robot-assisted rehabilitation systems, Petri net applications and more, yielding 100+ papers in international journals, books, and conferences.

Dr. Li actively organizes international events in IEEE RAS, SMC, CIS, and WIE societies. She chaired ICNSC'2016 and CASE'2022 and was Program Chair of SSCI'2023. Dr. Li served as editorial board member for IEEE Press. She's an associate editor for Engineering Applications of Artificial Intelligence, IEEE Transactions on Automation Science and Engineering (T-ASE), IEEE/CAA Journal of Automatica Sinica (JAS), IEEE Access, and IEEE SMC Magazine.

Prof. Xiaoou Li

Speech Title: Machine Learning and Big Data Analytics for Sustainable Food-Energy-Water Nexus

Abstract: The critical resources of food, energy, and water (FEW) are pivotal for human survival. Achieving sustainable access to these resources aligns with the United Nations' Sustainable Development Goals for 2030. Technological advancements have generated vast FEW-related data, attracting data scientists to address FEW nexus challenges. Notable challenges include predicting wind energy production, analyzing land irrigation efficiency, monitoring water quality, detecting plant diseases, and advancing precision agriculture. These challenges find resolution through the application of machine learning techniques and Big Data analytics. Associated themes encompass spatio-temporal data analysis, handling high-dimensional data, addressing data imbalances, managing the complexity of heterogeneous data sources, and integrating disparate data sets through data fusion strategies. This presentation embarks on an exploration of the FEW Nexus and the concomitant data science challenges it engenders. Subsequently, it shares preliminary findings from ongoing research endeavors, specifically focusing on the long-term prediction of time series within wind energy systems, even in the presence of missing data points.

Northeastern University

Shixin Liu received his B.S. degree in Mechanical Engineering from Southwest Jiaotong University, Sichuan, China in 1990, M.S. and Ph. D. degrees in Systems Engineering from Northeastern University, Shenyang, China in 1993, and 2000, respectively. He is currently a Professor of the College of Information Science and Engineering, Northeastern University, Shenyang, China. His research interests are in intelligent manufacturing, industrial big data, intelligent decision-making, and production planning and scheduling.

Prof. Shixin Liu

Speech Title: MP/CP Based Optimization Framework and Applications on APS of Steel Production Processes

Abstract: Mathematical programming (MP) is suitable for solving well-structured optimization models, and there are many mature commercial or open-source solvers. However, it is difficult to model complex constraints using MP. Modeling language of constraint programming (CP) is close to natural language, which is suitable for modeling complex constraints. A hybrid modeling and optimization method of MP/CP can take advantage of the respective strengths of MP and CP. In this paper, we propose an optimization framework with a mixture of MP and CP, and describe the applications of this optimization framework in APS system of complex industrial process represented by steel.

Prof. Ning Zhao

Beijing University of Science and Technology

Zhao Ning is currently professor of University of Science and Technology Beijing. Professor Zhao is also executive editor of journal of material handling. His research interests include coordination of multi-AGVs and digital twin technique. He has won first prize in 2023 and second prize in 2022 of Chinese Federation of Logistics and Purchasing.

Speech Title: Reinforcement learning enhanced autonomous mobile robots coordination

Abstract: Nowadays, more and more Autonomous Mobile Robots (AMR) are equipped to transport material in workshops and warehouses. Conflicts and deadlocks are problems when many AMRs are equipped in a same area. Consequently coordination between AMRs are critical to facilitate more AMR system applications and improve transport efficiency. According to timeliness of coordinate requirements, coordinate solutions have to be gained within seconds and optimization is hard. For this reason, reinforcement learning enhanced coordinate approach is studied. Experiments shows that the neural network has learned four techniques to avoid conflicts that may be caused by multiple AMRs.

Prof. Xiangwei Liu

Shanghai Maritime University

Prof. Xiangwi Liu obtained his Bachelor and Master Degree at Wuhan University of Technology in Mechanical Engineering. He obtained his PhD in the Section of Transport Engineering and Logistics at Delft University of Technology under the supervision of Prof. Gabriel Lodewijks and Dr. Yusong Pang. After his PhD, he worked in belt conveyor equipment industry for almost four years. In 2021, he was selected into Shanghai Top Oversea Talent Plan and Pujiang Talent Plan. In the same year, he joined Shanghai Maritime University and was appointed as a full professor at Logistics Engineering College. Currently he also serves as the Vice Director of Science and Technology Department at Shanghai Maritime University. His research interest is in bulk port equipment design and intelligent maintenance, and deep-sea mining. He has published more than 20 conference and journal papers, and conducted several research projects related to intelligent maintenance of belt conveyors and deep-sea mining technologies.

Speech Title: Challenges of Science and Technologies in Bulk Solids Handling towards Smart and Green Bulk Ports

Abstract: Development of Smart Ports and Green Ports are the goals of worldwide port authorities nowadays. For bulk ports, the development of Smart and Green Bulk Ports faces more scientific and technical challenges than container terminals. In this presentation, general layout of a typical bulk port will be given. In addition, challenges of science and technologies associated with bulk solids handling equipment for smart and green bulk ports will be presented and discussed in details. Such challenges may exist in current bulk solids handling theory, port equipment engineering design, and particularly maintenance strategies. Recommendations on how to solve these challenges for future will also be given.

Dr. Jingtao Sun
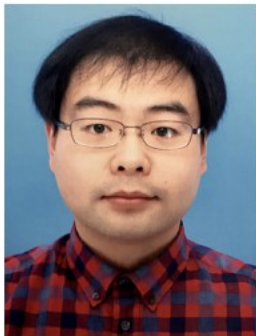
Research & Development, Hitachi, Ltd., Japan

Dr. Jingtao Sun, (Ph.D.-Informatics), now is a senior researcher at the services computing department, center for technology innovation, Research & Development, Hitachi, Ltd. He also is a off-campus advisor at the school of Mechanical Engineering, Dalian University of Technology, and an advisor at aerospace equipment direction, Liaoning Huanghai Laboratory, and an adjunct professor at the school of big data, Qingdao Huanghai University, China. He got his M.Sc. in Computer Science at the Tokyo University of Technology, and an Informatics Doctor's degree (Ph.D.) at The Graduate University for Advanced Studies, Japan. Currently, Dr. Jingtao Sun' research focus on carbon neutralization of data center, AI for renewable energy, invisible computing, edge/cloud computing, IoT, image processing, semantic segmentation, and sensor network.

Speech Title: A Power Consumption Prediction Method Considering Time Lag Between Server and Cooling Equipment for Green Data Center

Abstract: Curbing global warming through realizing a decarbonized society is one of the social issues attracting particular attention. Especially in the data center business, using renewable energy was considered for decarbonizing green data centers (DGDC). Since the abundance of renewable resources varies depending on the location and environment of the data center, predicting electricity power consumption is important for effectively using renewable energy. However, it is difficult to predict the power consumption of IT equipment and cooling equipment because there is a time lag between the increase in power consumption of the former and the increase in power consumption of the latter. In this talk, we would like to introduce our prediction method based on the respective correlation coefficients for predicting the time lag between IT and cooling types of equipment in data centers.

Traffic routes

Wuhan Tianhe International Airport -- Wuhan University of Technology (Yujiatou Campus)

Distance 36 km (42 minutes by car)

Wuhan Tianhe International Airport -- Wuhan Iron and Steel Hotel

Distance 34 km (39 minutes by car)

Hankou Station -- Wuhan University of Technology (Yujiatou Campus)

Distance 15 km (30 minutes by car)

Hankou Station -- Wuhan Iron and Steel Hotel

Distance 14 km (28 minutes by car)

Wuhan Station -- Wuhan University of Technology (Yujiatou Campus)

Distance 10 km (18 minutes by car)
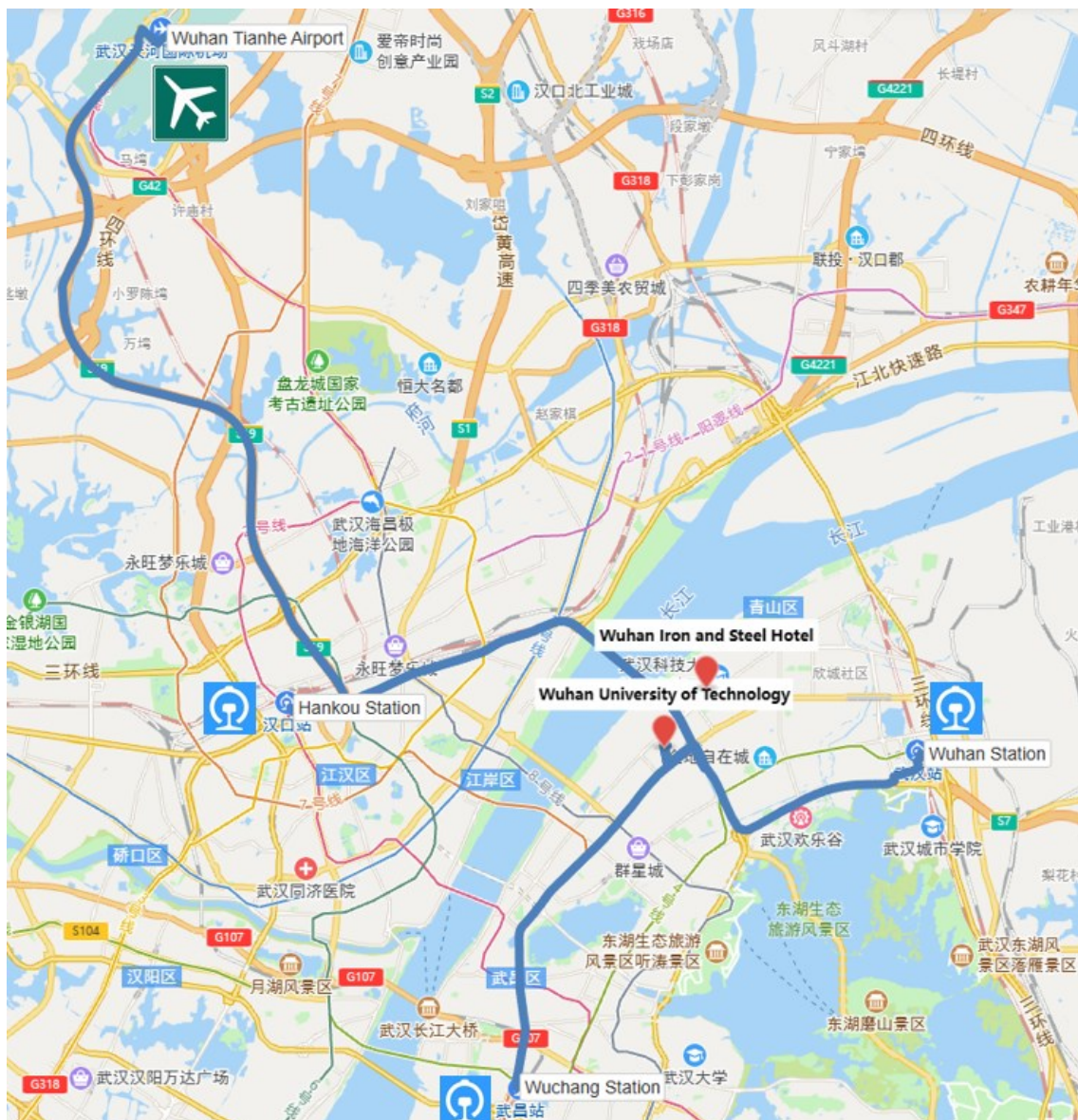
Wuhan Station -- Wuhan Iron and Steel Hotel

Distance 9 km (16 minutes by car)

Wuchang Station -- Wuhan University of Technology (Yujiatou Campus)

Distance 12 km (27 minutes by car)

Wuchang Station -- Wuhan Iron and Steel Hotel

Distance 14 km (32 minutes by car)

Map of Wuhan University of Technology （武汉理工大学余家头校区）

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