CAICC-IDIA|2023

2023 The 2nd China-Austria Innovation Cooperation Exchange Conference & the International Symposium on AI and Digital Economy

Infrastructure and Applications

CAICC-IDIA|2023

2023第二届中奥创新合作交流会暨国际人工智能与数字经济研讨会

基础设施与应用

Guided by
Nanjing Municipal Bureau of Science and Technology
Nanjing Gulou District Government

Organizers
China-Austria (Jiangsu) Innovation Cooperation Center
Nanjing (Austria) Oversea Collaborative Innovation Center
China-Austria Belt and Road Joint Laboratory on Artificial Intelligence and Advanced Manufacturing

Co-organizers
Jiangsu Society of Digital Economy
Nanjing University of Posts and Telecommunications, Edge Intelligence Research Institute
Hangzhou Joint Levorotary on Distributed Artificial Intelligence
The Belt and Road Information Research Institute of Hangzhou Dianzi University
MIIT Key Lab of Traffic Information Fusion & System Control

指导单位
南京市科学技术局
南京市鼓楼区人民政府

承办单位
中国-奥地利（江苏）创新合作中心
南京（奥地利）海外协同创新中心
中国-奥地利人工智能与先进制造“一带一路”联合实验室

协办单位
江苏省数字经济学会
南京邮电大学边缘智能研究院
杭州市分布式人工智能联合实验室
杭州电子科技大学“一带一路”信息技术研究院
交通信息融合与系统控制工业和信息化部重点实验室

CONTENT

PREFACE

2023 is the second outbreak of artificial intelligence (AI) in human history. AI once again "sweep" the global industries, as the industry calls out that "all industrial applications are worth redoing with AI" - AI and the digital economy have become the two major engines of global technological and economic development. The second China-Austria Innovation Cooperation Exchange Conference and the First International Symposium on AI and Digital Economy aim to gather experts and scholars in the fields of artificial intelligence and digital economy to discuss the opportunities and challenges faced by the development of AI and digital economy, especially in infrastructure construction and technology application. Experts attending the meeting will share the latest perspectives and trend judgments on the future development, discuss possible paths to strengthen international cooperation and exchange, and provide references for formulating strategies for the community development of artificial intelligence and digital economy.

Nanjing, formerly known as Jiangning, is a famous historical and cultural city, also well-known as tourist city with a history of over 2,400 years. It is one of the four ancient capitals of China, known as the "Six Dynasties Ancient Capital" and the "Oriental Red Capital". The modern Nanjing is also a city of science, education and innovation, with many good universities such as Nanjing University, Southeast University, Nanjing University of Science and Technology, Nanjing Forestry University, etc. The Nanjing Municipal Government is committed to building an innovative city and innovation hub, gathering a large number of high-tech enterprises and startups, and forming industrial clusters in life health, new energy, new materials, smart manufacturing and other industries. Nanjing welcomes experts and scholars from all over the world to come here for academic exchanges, scientific research cooperation and innovation and entrepreneurship activities.

SYMPOSIUM COMMITTEE

General Chairs:

Prof.Dr. Schahram Dustdar	Vienna University of Technology, Vienna, Austria
Prof.Dr. Qingshan Liu	Nanjing University of Posts and Telecommunications | Nanjing, China
Prof.Dr. Xiaobo Qu	Tsinghua University | Beijing, China
Prof.Dr. Vladimir Estivill Castro	Pompeu Fabra University | Spain

Program Chairs:

Asst. Prof. Dr. Stefan Nastic	Vienna University of Technology | Vienna, Austria
Asso. Prof. Dr.Tangyi Guo	Nanjing University of Science and Technology | Nanjing, China
Asso. Prof. Dr. Yongneng Xu	Nanjing University of Science and Technology | Nanjing, China
Prof.Dr. Xiaobin Xu	Hangzhou Dianzi University | Hangzhou,China

Organizing Chairs:

Dr. Guodong Wang	Sino-Austria Research Institute for Intelligent Industries | Nanjing, China
Prof.Dr. Yongan Guo	Nanjing University of Posts and Telecommunications | Nanjing, China

General Secretary:

M.Sc. Li Liu	Sino-Austria Research Institute for Intelligent Industries | Nanjing, China

Secretary:

M.Sc. Rui Xu	Sino-Austria Research Institute for Intelligent Industries | Nanjing, China

PROGRAM

Date	Time	Items	
20 July	14:00-17:00	Registration	
21 July	8:30-8:40	Opening Ceremony	
	8:40-8:50	Speech by Zhixin Zhang, First Grade Researcher of Nanjing Municipal Science & Technology Bureau	
	8:50-9:00	Speech by Quan Feng, Deputy District Mayor of Nanjing Gulou District Government	
	9:00-9:10	Welcome speech by Prof.Dr. Schahram Dustdar	
	9:10-9:20	Group Photo	
	9:20-9:50	Keynotes	Prof.Dr. Schahram Dustdar Title: Distributed Intelligence in the Computing Continuum Aff.: Vienna University of Technology
	9:50-10:20	Keynotes	Prof.Dr. Xiaobo Qu Title: Low-carbon urban logistics and mobility: vehicles, data, and cloud platform Aff.: Tsinghua University
	10:20-10:30	Coffee Break	
	10:30-11:00	Keynotes	Prof.Dr. Xiangyang Li Title: AIOT:Wireless Smart Sensing, Computing and Privacy Issues Aff.: University of Science and Technology of China
	11:00-11:30	Keynotes	Prof.Dr. Vladimir Estivill Castro Title: Model-Driven Development of Embedded IoT Software for Distributed Applications Aff.: Pompeu Fabra University
	11:30-12:00	Keynotes	Prof.Dr. Huadong Ma Title:Toward Internet of Things with Endogenous Intelligence Aff.: Beijing University of Posts and Telecommunications
	12:00-13:30	Lunch	
	13:30-13:45	Industry Reports	Mr.Haijiang Chen Title: Technology-enabled agriculture, culture and tourism industry digital intelligence transformation Aff.: Zhejiang Lishi Technology Co., Ltd.
	13:45-14:00	Industry Reports	Dr. Guodong Wang Title: Coovally - AI model training and application platform Aff.: Sino-Austria Research Institute for Intelligent Industries & Nanjing Coovally Computing Technology Co., Ltd.
21 July	14:00-14:15	Presentation	Prof.Dr. Yongneng Xu Title:Railway Intelligent Operation & Maintenance Aff.:Nanjing University of Science and Technology
	14:15-14:30	Presentation	Ass. Prof.Dr. Tangyi Guo Title: AI driven Intelligent Inspection Technology and Industrialization of Road Infrastructures Aff.:Nanjing University of Science and Technology
	14:30-14:45	Presentation	Prof.Dr. Jiangang Zhu Title:The Impact of AI on the Furniture Industry Aff.: Nanjing Forest University
	14:45-15:00	Presentation	Prof.Dr. Xiaobin Xu Title:Safety Behavior Analysis in Industrial Process Based on IoT and Machine Vision Aff.: Hangzhou Dianzi University
	15:00-15:15	Presentation	Prof.Dr. Yongan Guo Title:Research and reflection on intelligent recreation based on the Internet of Things Aff.:Nanjing University of Posts and Telecommunications
	15:15-15:30	Presentation	Asst. Prof.Dr. Stefan Nastic Title： Serverless Compute Fabric for Edge-Cloud Continuum: Opportunities and Challenges Aff.:TU Wien and IntelliEdge GmbH
	15:30-15:45	Presentation	Dr. Philipe Reinisch Title: From Silk Road to Silicon Road: The Intersection of Business-driven Innovation and AI Aff.:SilkRoad 4.0
	15:45-16:00	Coffee Break	
	16:00-17:00	Panel Discussion Title: Opportunities and Challenges of Next Generation Artificial Intelligence Technology Industry Landing	
	17:00-17:15	Presentation	Dr. Praveen Kumar Donta Title:Unleashing the Potential of Distributed Computing Continuum Systems Aff.:Vienna University of Technology
	17:15-17:30	Presentation	Dr. Victor Casamayor Pujol Title:Self-adaptation in Distributed Computing Continuum Systems Aff.:Vienna University of Technology
	17:30-17:45	Presentation	Prof.Dr. Qinghua Liu Title: Automobile loaded Road data acquisition equipment based on Cloud computing Aff.:Jiangsu University of Science and Technology
	17:45-18:00	Presentation	Dr. Minxian Xu Title: Automobile loaded Road data acquisition equipment based on Cloud computing Aff.:Shenzhen Institute of Advanced Technology，Chinese Academy of Sciences
	18:00-18:05	End	

PANEL DISCUSSION

Title: Opportunities and Challenges of Next Generation Artificial Intelligence Technology Industry Landing

Host:

Dr. Guodong Wang
Sino-Austria Research Institute for Intelligent Industries

Guests:

Prof.Dr. Schahram Dustdar
Vienna University of Technology

Prof.Dr. Xiaobo Qu
Tsinghua University

Prof.Dr. Qingshan Liu
Nanjing University of Posts and Telecommunications

Dr.Jun Ma
Jiangsu Society of Digital Economy

Mr.Xiangyang Liu
CISO and President of Software Engineering Institute of Midea Group

Prof.Dr. Huadong Ma
Beijing University of Posts and Telecommunications

Prof.Dr. Shui Yu
University of Technology Sydney

SPEECH

01 | Speaker | Prof.Dr. Schahram Dustdar
Vienna University of Technology

Head of the Research Division of Distributed Systems at the TU Wien, Austria Schahram Dustdar is a Full Professor of Computer Science at the TU Wien, heading the Research Division of Distributed Systems, Austria. He holds several honorary positions: University of California (USC) Los Angeles; Monash University in Melbourne, Shanghai University, Macquarie University in Sydney, University Pompeu Fabra, Barcelona, Spain. From Dec 2016 until Jan 2017, he was a Visiting Professor at the University of Sevilla, Spain and from January until June 2017 he was a Visiting Professor at UC Berkeley, USA. From 1999 – 2007 he worked as the co-founder and chief scientist of Caramba Labs Software AG in Vienna (acquired by Project NetWorld AG) - a venture capital co-funded software company focused on software for collaborative processes in teams. He is co-founder of edorer.com (an EdTech company based in the US) and co-founder and chief scientist of Sinoaus.net, a Nanjing, China based R&D organization focusing on IoT and Edge Intelligence. He serves as Editor-in-Chief of Computing (Springer). Dustdar is recipient of multiple awards: IEEE TCSVC Outstanding Leadership Award (2018), IEEE TCSC Award for Excellence in Scalable Computing (2019), ACM Distinguished Scientist (2009), ACM Distinguished Speaker (2021), IBM Faculty Award (2012). He is an elected member of the Academia Europaea: The Academy of Europe, as well as an IEEE Fellow (2016) and an Asia-Pacific Artificial Intelligence Association (AAIA) Fellow (2021) and the AAIA president (since 2021).

Title & Abstract | Distributed Intelligence in the Computing Continuum

Modern distributed systems also deal with uncertain scenarios, where environments, infrastructures, and applications are widely diverse. In the scope of IoT-Edge-Fog-Cloud computing, leveraging these neuroscience-inspired principles and mechanisms could aid in building more flexible solutions able to generalize over different environments. A captivating set of hypotheses from the field of neuroscience suggests that human and animal brain mechanisms result from few powerful principles. If proved to be accurate, these assumptions could open a deep understanding of the way humans and animals manage to cope with the unpredictability of events and imagination.

02 Speaker

Prof.Dr. Xiaobo Qu
Tsinghua University

Xiaobo Qu , tenured professor and doctoral supervisor at the School of Vehicle and Transportation, Tsinghua University. Born in Zouping City, Binzhou City, Shandong Province. Since December 2021, he has been teaching full-time at the School of Vehicle and Transportation, Tsinghua University, and was selected as a Yangtze River Scholar Distinguished Professor, a high-level overseas talent program in China. Before returning to China, he was a chair professor at Chalmers University of Technology in Sweden and taught in Australia and Sweden for 10 years.He is committed to introducing the latest technologies such as control, communication, and operational decision-making into the urban transportation system of the future. Focusing on travel bottlenecks, improving the efficiency, safety, environmental protection and fairness of the transportation system. And focus on research in three-dimensional transportation, air-ground collaborative logistics and travel. He has published more than 100 journal papers in the above fields. In the past five years, Professor Qu has presided over scientific research funds of over 10 million euros from the EU, the Swedish Science and Technology Department, the Swedish Research Council, the Australian Research Council and the Chinese Ministry of Education. He was invited to serve as an initial evaluator or final evaluator expert for major projects such as the EU Talent Program, the Australian Research Council Centre of Excellence, the Dutch Research Council VICI, the Hong Kong Research Grants Council Theme Based Scheme, the Singapore Theme Project Thematic Research Grant, and major domestic talent projects.He currently serves as the editor-in-chief of Communications in Transportation Research and is on the editorial boards of Transportation Research Part A, Part E, The Innovation, IEEE Trans on Cybernetics, ASCE Journal of Transportation Engineering, IEEE ITSM and other journals. He also serves as chairman of the Transportation Modeling Committee of the World Conference on Transport Research Society. He has won the Singapore Minister of Transport Innovation Award, the Australian Department of Education Endeavour Changjiang Research Award, and other honors. He has trained more than 30 doctoral students and postdoctoral fellows, all of whom are employed in universities, transportation departments, well-known Internet companies and vehicle manufacturers in China, Australia and Europe. In August 2020, he was elected to the Academia Europaea.

Title & Abstract

Low-carbon urban logistics and mobility: vehicles, data, and cloud platform

Urbanizaiton is accelerating. Despite its economic, political, cultural, educational, and medical advantages, it leads to severe traffic congestion, which affects resident's wellbeing. In our lab, we develop a few intelligent vehicles and associated cloud platform to make possible a near-zero carbon urban mobility and parcel delivery. For urban parcel delivery, we develop a landing platform that allows a parcel-carrying drone to land on the rooftop of a moving vehicle. This system enables smooth drone-vehicle cooperation, which resolves two of drones' major problems -limited range and high cost. By using drones for the first and last mile, and the rooftops of social vehicles, the passenger-parcel consolidated vehicle sharing model holds potential to replace urban trucks and trailers. For urban passenger mobility, we develop new modularized bus pods that are able to couple and decouple while in motion. This product will resolve the main problems of a traditional bus: low speed due to frequent stops, and inefficient transfer. This new vehicles will have a travel speed that is similar to a taxi, and have an energy consumption per passenger that is similar to a traditional bus. For the long term solution of urban passenger mobility, we also discuss how flying cars will affect the current surface transport network.

03 Speaker

Prof.Dr. Xiangyang Li
University of Science and Technology of China

Dr. Xiang-Yang Li is a Distinguished Professor and Executive Dean at School of Computer Science and Technology, USTC. He is an ACM Fellow (2019), IEEE fellow (2015), an ACM Distinguished Scientist (2014). He served as a co-Chair of ACM China Council from 2017 to 2020. He was an assistant, associate, and full professor at Computer Science Department of IIT from 2000 to 2016. Dr. Li received MS (2000) and PhD (2001) degree at Department of Computer Science from University of Illinois at Urbana-Champaign, and received a Bachelor degree at Department of Computer Science from Tsinghua University, P.R. China, in 1995.
His research interests include Artificial Intelligence of Things(AIOT), privacy and security of AIOT, and data sharing and trading. He received more than ten best paper awards from a number of international conferences, including ACM MobiCom.

Title & Abstract

Wireless Smart Sensing, Computing and Privacy Issues

Some core challenges of the Artificial Intelligence of Things (AIOT) systems are to overcome low-power cross-domain deep sensing, reliable network connectivity in complex scenarios, and intelligent computing. In this report, I will first overview some of the current challenges of AIOT, and share some of our team's preliminary research results and explorations in the field of AIOT, including

1) intelligent sensing based on low-power (even battery-free) technologies, using RFID-based, wearable or battery-free devices
2) intelligent computing that supports data and computing offloading
3) protecting the privacy of users for AIOT scenario.

04 Speaker

Prof.Dr. Vladimir Estivill Castro
Pompeu Fabra University

Vladimir Estivill-Castro is currently team co-leader of MI-PAL, who has participated in over 10 editions of RoboCup in the Standard Platform League (including the last three editions). His main interests are software engineering, model-driven engineering, algorithmic engineering, computational complexity, intelligent data analysis, privacy-preserving data mining and knowledge discovery.Prof. Estivill-Castro holds a Ph.D. from the University of Waterloo in Canada and degrees from UNAM in Mexico. He serves in the editorial board of Security and Privacy, Wiley (ISSN: 2475-6725), is editor in chief of the series Conferences in Research and Practice in Information Technology. Prof. Estivill-Castro also and an adjunct at Griffith University in Australia. He is also ACM-Senior Member, IEEE-Senior Member. His H-index in Google Scholar is over 30.He has authored over 100 technical conference and journal articles and several book chapters and encyclopedia chapters and one monograph. He received an Australian Teaching and Learning Citation for Ph.D. Supervision in Computer Science in 2010 and the Best Paper Award at the Australasian Computer Science Conference in 2012.He was the keynote speaker at the Sixteenth International Conference of the Catalan Association of Artificial Intelligence (CCIA 2013). He has received competitive funding in Australia, Canada, Mexico, and Spain.

Title & Abstract

Model-Driven Development of Embedded IoT Software for Distributed Applications

Current design paradigms have shown severe shortcomings in implementing the distributed intelligence concept in the industry. The limitations are evident in all phases of system engineering, from requirements elicitation, software development, verification, validation, reliable execution, and maintenance.

The logic-labelled finite-state machines (LLFSM) paradigm offers practical model-driven engineering that provides easy executable modelling to capture requirements and precise semantics for automatic model checking. The paradigm of LLFSMs moves design to a time-triggered approach, as opposed to an event-driven approach enabling the design of real-time, concurrent distributed systems, their deployment and formal verification using agnostic mechanisms. The executable models are automatically translated by model-to-text transformation to several programming languages (particularly in the IoT domain). Also, they can be model-to-model loyally transformed into the input language of model checkers. We present the life cycle of using LLFSMs in designing executable models for verifiable concurrent and distributed systems under a model-driven development.

05 Speaker

Prof.Dr. Huadong Ma
Beijing University of Posts and Telecommunications

Dr. Huadong Ma is a Professor of School of Computer Science, and Vice-Chair of Academic Committee, Beijing University of Posts and Telecommunications (BUPT), China. He is also Director of Beijing Key Lab of Intelligent Telecommunications Software and Multimedia, BUPT. He is Chief Scientist of the project "Basic Research on the Architecture of Internet of Things" supported by the National 973 Program of China from 2010 to 2013. He received his PhD degree in Computer Science from the Institute of Computing Technology, Chinese Academy of Science in 1995. His current research focuses on sensor networks and Internet of things, multimedia computing, and he has published over 400 papers in journals or Conferences and 5 books on these fields. As a co-author, he got the 2019 Prize Paper award of IEEE Transactions on Multimedia and the 2018 Best Paper Award from IEEE MultiMedia. He was awarded National Funds for Distinguished Young Scientists in 2009, the Natural Science Award of the Ministry of Education, China in 2017. He was/is an Editorial Board Member of the IEEE Transactions on Multimedia, IEEE Internet of Things Journal, and ACM Transactions on Internet of Things. He serves for Chair of ACM SIGMOBILE China, Director of CCF Technical Committee on IoT. He is IEEE/CCF/CAAI Fellow.

Title & Abstract

Toward Internet of Things with Endogenous Intelligence

In this talk, first, we will introduce the long-term challenges of the development of IoT. Combining AI theory, then we will present some explorations and recent research progresses on intelligent sensing, intelligent transmission, and intelligent service in the IoT environment. In the future, endogenous intelligence will drive the revolution of IoT, we will discuss the open issues on IoT area, such as the theories and key technologies of human-like sensing, concise and intelligent networking, and cognitive service. The breakthrough for solving the above problems will promote the development of Internet of Things.

06 Speaker

Mr. Haijiang Chen
Zhejiang Lishi Technology Co., Ltd.

Haijiang Chen, Senior Engineer, EMBA 32 alumnus of Cheung Kong Graduate School of Business, Hangzhou High-level Talent, Expert of China Tourist Attractions Association, has many years of entrepreneurial background at home and abroad.

He has been the Chairman of the Board of Directors of Lishi Technology since 2010, when he founded Zhejiang Lishi Technology Co. Chen Haijiang has always insisted on scientific and technological innovation, encouraged support for product technology innovation and upgrading, and has in-depth research and unique insights in business management, new product and technology development, and market expansion. As a core drafter, he participated in the development of China's first "Rural Information Officer Cultivation Standard" group standard, and has published "Big Data-based Scenic Spot Traffic Statistics Evaluation System and Method", "A Distributed High Concurrency Cloud Storage Database System and its Load Balancing Method", "Big Data Integration Parallel Storage and Scheduling Method and System for Smart Tourism", etc. on big data analysis and storage, digitalization of cultural tourism, Internet of Things, and industry management. He has published patents and monographs on big data analysis and storage, digitalization system of cultural tourism, Internet of Things, industry management, etc.

Title & Abstract

Technology-enabled agriculture, culture and tourism industry digital intelligence transformation

Mainly through Zhejiang Lishi Technology Co.Ltd. based on 3T integration, AI algorithms and big data, SaaS-based services, IoT application advantages, the five core competencies of the Wenbo Yuan Universe and seven standardized self-researched products in the agriculture, culture and tourism industry digital construction services, agriculture, culture and tourism industry operation services, the Wenbo Yuan Universe and immersive experience in three major business areas of the actual application of the technology through the specific case of in-depth analysis of how to technology empowered by the transformation and upgrading of the agriculture, culture and tourism industry digital intellectualization.

07 Speaker

Dr. Guodong Wang
Sino-Austria Research Institute for Intelligent Industries &
Nanjing Coovally Computing Technology Co., Ltd.

Guodong Wang, President and Chairman of Sino-Austria Research Institute for Intelligent Industries, General Manager of China-Austria (Jiangsu) Innovation Cooperation Center, Ph.D. in Computer Science from Vienna University of Technology, Austria, Postdoctoral Fellow and Machine Learning Researcher from Vienna University of Technology, Visiting Scholar from University of Cambridge, UK, Head of Hangzhou Distributed Artificial Intelligence Joint Laboratory, Master's Supervisor of Nanjing University of Posts and Telecommunications, ACM China Embedded Systems (ACM China SIGBED) (ACM China SIGBED) youth member, 2021 Jiangsu Youth Science and Technology Innovation "U35 Climbing Peak" Innovation Award winner. He has long been engaged in research and application of computer vision technology, and has rich experience in research and development of EU Horizon project and technology industrialization.

Title & Abstract

Coovally - AI model training and application platform

Coovally aims to help users save time and capital cost of the AI intelligent system landing, and improve the risk controllability of the AI project landing. By continuously improving and enriching Coovally's model library and various algorithm libraries and easy-to-use toolboxes, AI can be implemented quickly.And coovally can help companies improve their AI stack technology development capabilities so that AI systems can be applied faster at a lower cost. The application areas of coovally include industrial quality inspection (optical lenses, special equipment welding, etc), geological disaster monitoring, power industry equipment monitoring, medical specialty diagnosis, etc.

08 Speaker

Prof.Dr. Yongneng Xu
Nanjing University of Science and Technology

Yongneng Xu, Director of the Institute of Transportation Research of Nanjing University of Science and Technology, Professor, Head of Transportation Engineering of Nanjing University of Science and Technology, Nanjing "321" leading scientific and technological talents, senior expert advisor of Nanjing Metro Group Company, expert of China's Urban Rail Transit Sustainable Transportation Development Forum, editorial board member of the Journal of Weapons and Equipment Engineering, reviewer of South China University of Science and Technology (Shiran Science Edition), etc. He is also a member of the editorial board of the Journal of Military Equipment Engineering and a reviewer of the South China University of Technology (Shiran Science Edition). His main research interests are in urban transport planning and management, smart city, intelligent transportation, rail transit special road planning, operation management and sustainable development strategy, new energy vehicles - infrastructure layout planning and management, etc. As a project leader, he has undertaken more than 20 projects on smart city, intelligent transportation and rail transit road planning, special planning and sustainable development planning, and has cooperated well with many cities' comprehensive transportation authorities and urban rail transit departments such as Nanjing, Zhengzhou, Hefei, Tianjin, Qingdao, Xiamen, Suzhou, Xi'an, Chengdu and Wuxi. In recent years, he has undertaken and participated in a number of national key research and development programs for intelligent transportation and advanced rail transportation, more than 10 projects of the National Natural Science Foundation of China and Jiangsu Provincial Science and Technology Support Program, published more than 60 papers, edited 3 textbooks, selected 2 national planning textbooks, and published 1 academic monograph. He has obtained 4 provincial and ministerial level appraisal results, all of which are at the leading level in China and some of which are at theinternational advanced level.

Title & Abstract

Railway Intelligent Operation & Maintenance

This report focuses on the key technical requirements for the whole life cycle operation and maintenance of key urban rail transit equipment, based on the construction and optimization analysis of advanced intelligent operation and maintenance technology innovation application scenarios, the analysis and application of intelligent operation and maintenance international common technical standard requirements, and the demonstration and intelligent operation and maintenance key technology innovation application through the actual operation and maintenance scenario case of Nanjing Metro.

09 Speaker

Ass. Prof.Dr. Tangyi Guo
Nanjing University of Science and Technology

Professor Tangyi Guo, associate professor and master's supervisor at Nanjing University of Science and Technology, director of the Intelligent Transportation and Safety Research Institute, and postdoctoral fellow at Army Engineering University (supervised by Academician Qian Qihu). He serves as an expert at the Zijin Science and Technology Call Center in Jiangsu Province and a director of the Underground Space Branch of the China Rock Mechanics and Engineering Society.His main research areas are intelligent transportation and traffic safety. He has presided over 6 national and provincial research projects such as the National Natural Science Foundation of China and the Ministry of Education's Social Science Foundation. Four talent and innovation and entrepreneurship projects such as the "Zijin Star" Excellence Program and "Entrepreneurship Nanjing", as well as more than 20 other applied subjects. He won the second prize of science and technology of China Intelligent Transportation Association and the second prize of science and technology of China Transportation Association. He guided students to win the first prize of Jiangsu Province and the third prize of the national finals in the "Internet+" University Student Innovation and Entrepreneurship Competition, and another 8 provincial and national science and technology competition awards; published more than 40 academic papers, including 15 SCI/EI retrieved, 6 authorized invention patents, and 5 soft copyright applications.His research focuses on intelligent transportation technologies such as traffic flow detection, traffic accident identification, driver behavior analysis, and traffic control optimization. The research results have been applied to urban road intersections, highways and urban rail transit. He has undertaken research and development tasks for many companies such as Hikvision, Dahua Technology, and Anthropic. He has published Science China Information Sciences, IEEE Transactions on Intelligent Transportation Systems, Automation in Construction, Accident Analysis and Prevention, and other academic papers.

Title & Abstract

AI driven Intelligent Inspection Technology and Industrialization of Road Infrastructures

The construction of road infrastructure in China is gradually becoming saturated and is in a transitional stage from "construction" to "operation and maintenance". China has built over 5 million kilometers of various levels of highways, and their maintenance work has shortcomings such as heavy workload, low frequency and quality, and heavy reliance on manual labor. The development of AI technology provides a good solution to these difficulties. The intelligent inspection system driven by AI is composed of vehicle end, handheld end, roadside end, airborne end, satellite end, and cloud server, and has four major functions:

(1) road full asset automatic collection based on improved deep neural network;
(2) Road state quantification detection based on deep learning and machine vision;
(3) Standardized road inspection process optimization and decision support;
(4) Rapid 3D realistic modeling based on multi-source data and Context Capture.

The system has the advantages of efficiency, accuracy, standardization, and flexibility, and has been applied in more than ten cities such as Nanjing, Nantong, Suqian, and Huzhou. The event detection accuracy exceeds 85%, and the inspection efficiency has been improved by 68%.

10 Speaker

Prof.Dr. Jiangang Zhu
Nanjing Forest University

Professor Jiangang Zhu, Doctor and Professor, Secretary of Party Committee, School of Home and Industrial Design, Nanjing Forestry University. He has long been engaged in teaching, research and technical services for green home products, intelligent manufacturing of furniture, etc.His main research areas include furniture manufacturing technology and industrial engineering, advanced furniture manufacturing technology and informatization, wood products production technology, etc. Focusing on the transformation and upgrading of China's furniture industry, he focuses on research on technical solutions and policy recommendations for green manufacturing and product service systems. Focusing on the transformation and upgrading of China's traditional furniture industry, he focuses on research on the development and application of advanced technologies such as computer-aided design and manufacturing. He has presided over more than 10 provincial and ministerial research, teaching reform and scientific research projects. He has published more than 90 academic papers, including more than 10 SCI papers. He has provided consulting and technical services for dozens of leading furniture manufacturing enterprises in China. The results have been applied in key national furniture industrial parks and a number of enterprises, effectively improving resource utilization efficiency and environmental protection levels, and enhancing the technological innovation capabilities and overall competitiveness of related enterprises. In recent years, he has focused on green and intelligent manufacturing technology of wood products, built green homes and health residences, and studied digital design and manufacturing technologies for customized furniture. He has presided over the establishment of the Postdoctoral Scientific Research Station of Green Home Furnishing, and the Wood Furniture Engineering Technology Research Center of the Ministry of Education. He has won 4 provincial and ministerial level scientific and technological progress awards.He has trained nearly 200 masters and doctors. Many of them now hold management positions in China's furniture companies and governments. He has participated in the assessment and evaluation of experts in the discipline of national university professional standards preparation, academic degree evaluation, innovation platform construction and National Science Foundation projects. He has served as an editor-in-chief or editorial board member of 7 academic journals including Furniture and Interior Design.

Title & Abstract

The Impact of AI on the Furniture Industry

In the Digital Economy era, Artificial intelligence (AI) is the newest trend to embrace. Due to its rapid growth, AI is shaping the future of nearly every industry, including the traditional labor-intensive industry such as furniture industry. The furniture industry has always been very competitive, and firms are continually seeking new business strategies to differentiate themselves from the competition. AI has become a base-enabled tool for a competitive edge in recent years, which is revolutionizing every facet of the furniture industry, from product design to manufacturing process.

11 Speaker

Prof.Dr. Xiaobin Xu
Hangzhou Dianzi University

Professor Xiaobin Xu graduated from Shanghai Maritime University with a degree in Power Electronics and Power Transmission. He is currently serving as an expert in the Ministry of Science and Technology China-Austria Cooperative Laboratory for Artificial Intelligence and Advanced Manufacturing (AIIAM) jointly laboratory between China and Austria. He was a visiting scholar at the Decision and Cognitive Science Research Center of the University of Manchester, UK; and a postdoctoral fellow at the Control Science and Engineering Postdoctoral Workstation, Department of Automation, Tsinghua University. He is a member of the Technical Process Fault Diagnosis and Safety Special Committee, China Association of Automation; and a member of the Information Fusion Branch, China Aerospace Society.He is currently working at Hangzhou Dianzi University, mainly engaged in theoretical and applied research on status monitoring, safety assessment, fault prediction and health management of industrial/engineering systems, intelligent medical expert auxiliary decision making, information fusion and expert systems. He has presided over the NSFC-Zhejiang Provincial Two-Transformations Integration Joint Fund (Key Project), National Natural Science Foundation of China, Zhejiang Provincial Key R&D Plan, Zhejiang Provincial Natural Science Foundation/Public Welfare Technology Application Research, China Postdoctoral Science Foundation and other projects. He has published more than 90 papers in Information Sciences, IEEE Trans. Instrumentation and Measurement, Control Engineer Practice, ISA Transactions, Knowledge-based systems, Journal of Automation, Control Theory and Applications, etc. He has authorized more than 30 invention patents and published 4 academic monographs. He won the second prize of the State Teaching Achievement Award, the first prize of Zhejiang Provincial Teaching Achievement Award, and the third prize of Shanghai Technical Progress Award. His research interests include industrial process monitoring and fault diagnosis; safety analysis and assessment of industrial systems; hydropower unit health management; intelligent medical decision support; uncertainty modeling and information fusion in monitoring processes; industrial expert systems and knowledge automation. In recent years, he has conducted in-depth research on the theory and method of fault diagnosis and risk assessment for complex electromechanical equipment like pumps, valves and power units in the Yangtze River Delta region.

Title & Abstract

Safety Behavior Analysis in
Industrial Process Based on IoT and Machine Vision

This report aims to introduce a method for analyzing worker action based on intelligent IoT and machine vision. The method utilizes technologies such as IoT, deep learning, and machine vision devices to collect worker action data in the production process, and transmit the data to the cloud server for intelligent analysis. Through the analysis and processing of worker action data, combined with expert experiences, the intelligent analysis model of worker action for industrial production safety is constructed to realize the identification of unsafe worker action and the early warning of potential safety hazards, so as to minimize the safety risks in the industrial production process and provide strong support for improving industrial production safety.

12 Speaker

Prof.Dr. Yongan Guo
Nanjing University of Posts and Telecommunications

Professor Yongan Guo, professor and senior engineer at Nanjing University of Posts and Telecommunications, member of the China Farmer's Democrat Party. He is a key member of the "Ubiquitous Wireless Communication and Internet of Things" Science and Technology Innovation Team of Colleges and Universities in Jiangsu Province. He is currently a member of the China Institute of Electronics, a member of the China Institute of Communications, and the deputy secretary-general of the "Internet of Things and Intelligent Information Systems" Special Technical Committee of the Communication Branch of the China Institute of Electronics. He is also a member of the Wireless Communication Special Committee of the Jiangsu Communication Society and the deputy director of the Jiangsu Small and Medium Enterprises Internet of Things Industry Public Technology Service Platform.He currently serves as the dean of the Edge Intelligence Research Institute of Nanjing University of Posts and Telecommunications. He has participated in 5 national projects including major national programs, National 973 Program, national major scientific research instrument development projects, and National Natural Science Foundation of China. He has presided over 4 provincial and ministerial level scientific research projects, including the Ministry of Industry and Information Technology 's communication soft science project, the Jiangsu Provincial University Natural Science Foundation project, the Nanjing Emerging Industry Guidance Special Program, and more than 10 corporate cooperation projects. He has published more than 30 academic papers, including 9 SCI/EI papers, and applied for more than 30 national invention patents. He has won 1 first prize and 1 third prize of Science and Technology Award of China Institute of Communications, 2 first prizes of Science and Technology Progress Award of Jiangsu Communication Industry, and 1 first prize of Nanjing Science and Technology Progress Award. His main research areas are ubiquitous wireless communication and Internet of Things technology. His research topics involve: wireless communication, network virtualization technology, Internet of Things technology and applications.His recent research focuses on ubiquitous network architecture, wireless network resource allocation, cloud/edge collaborative computing, industrial Internet security, and Internet of Things. He has led the development of technologies such as ubiquitous network architecture, radio resource virtualization/allocation, mobile edge cloud network deployment. He served as the project leader of the Internet of Things public service platform in Jiangsu Province to promote the research and application of the Internet of Things. He has provided advisory services for many companies such as China Unicom, China Mobile and Jingdong Group.

Title & Abstract

Research and reflection on intelligent recreation based on the Internet of Things

This report is to share the research and thinking of IoT-based smart wellness. Nowadays, the rapid development of IoT technology is driving the rise of smart services and realizing the global Internet of Everything and smart services. Aiming at the goal of creating a Smart Hospital IoT Ecological Platform,our project team developed iHOS to fulfill the organic integration of multiple information systems in hospitals and raise the level of hospital management and services rapidly. To combine medical and health caring, our project team has developed a one-stop medical service platform, aims to solve the users' pain points, provides valuable services for users and builds a good medical and health caring ecology. At present, with strong capability of service, Yubang has already cooperated with different units and institutions in multiple application cases, and is continuously optimizing and expanding its services to meet the diversified users' needs.

13 Speaker

Asst. Prof.Dr. Stefan Nastic
TU Wien and IntelliEdge GmbH

Prof. Stefan Nastic is an Assistant Professor at the TU Wien, working in the Distributed Systems Group. He is also a Founder and CEO of IntelliEdge GmbH - a company that provides consulting and development services for Cloud Computing, IoT/Industry 4.0, and Artificial Intelligence worldwide. Stefan is also a member of the Technical Steering Committee in Linux Foundation's Centaurus project. Stefan got his Ph.D. in 2016 from TU Wien, with a thesis: "Programming, Provisioning, and Governing IoT Cloud Applications". His research interests include serverless computing, edge-cloud continuum, AI /Edge AI and Reliability engineering.
Over the last decade, Stefan has been involved with a number of large commercial and research projects related to the Internet of Things, Edge Computing, and Cloud Computing, such as a multi-million Pacific Controls Cloud Computing Lab (PC3L) and Futurewei Polaris Cloud. During this time, Stefan has gained extensive experience acting as a researcher, product owner, project manager, technical coordinator, and advisor. Stefan also has a rich portfolio working as an independent consultant, solution architect, and expert software engineer, assisting companies from various industries to develop and advance their Cloud, IoT, and Edge solutions.

Title & Abstract

Serverless Compute Fabric for Edge-Cloud Continuum: Opportunities and Challenges

Serverless computing has been establishing itself as a compelling paradigm for the development of modern cloud-native applications. Serverless represents the next step in the evolution of cloud programming models, services, and platforms, which is especially appealing due to its low management overhead, easy deployment, scale-to-zero, and promise of optimized costs. In this talk, we take a closer look at the state of serverless computing, particularly focusing on the opportunities and challenges related to building Serverless applications and systems in the edge-cloud continuum.

14 Speaker

Dr. Philipe Reinisch
SilkRoad 4.0

Dr. Philipe Reinisch, born on June 28th, 1974 in Vienna, Austria, has dedicated his career to the intersection of technology, innovation, and strategy. With a background in Industrial Engineering, Reinisch has expertly navigated the tech industry for over two decades, becoming a recognized leader in emerging technology management, strategic networking, and business development.

Title & Abstract

**From Silk Road to Silicon Road:
The Intersection of Business-driven Innovation and AI**

Charting a course through the next era of digital disruption, this talk, ´From Silk Road to Silicon Road: The Intersection of Business-Driven Innovation and AI,´ promises a stimulating exploration of AI's transformative role across industry sectors. We are at the dawn of AI's second wave in 2023, and it's time to shift our perspective and critically examine its profound influence on traditional businesses.

The narrative weaves a fascinating thread between the fabled Silk Road and the digital highways of today, both momentous milestones in the annals of trade. The Silk Road, a network of ancient trade routes, birthed an era of unprecedented commercial progress, cultural interchange, and ingenuity. Today, AI, as the backbone of the digital landscape, is catalyzing a parallel upheaval in the virtual domain.Bringing this journey to life, we delve into how AI is molding business blueprints and erecting an innovative digital framework. We showcase AI's tantalizing possibilities for business value generation, operational efficiency, and innovation. To illustrate this, we'll present tangible instances across diverse industries that have reaped the rewards of an AI-centric metamorphosis.

Yet, the journey is not without its challenges. Our narrative will also look soberly at the hurdles impeding this transformative wave. Ethical dilemmas, data privacy implications, the imperative for sturdy digital architecture, and regulatory complications are all barriers to AI's full potential in business. We'll dissect these impediments and explore potential pathways to overcome them.

Inviting AI researchers, innovators, and business trailblazers to the discussion, this talk encourages a fresh envisioning of AI's role in business evolution. As we steer forward, it's pivotal to seize the power of AI and use it not merely to mirror but to amplify and innovate within the business world. Join us as we embark on this exciting journey along the Silicon Road.

15 Speaker

Dr. Praveen Kumar Donta
Vienna University of Technology

Dr. Praveen Kumar DontaCurrently working as Postdoc at Distributed Systems Group, TU Wien (Vienna University of Technology), Vienna, Austria since July 2021. He is received his Ph. D. at Indian Institute of Technology (Indian School of Mines), Dhanbad from the Department of Computer Science and Engineering in May 2021. From July 2019 to Jan 2020, he is a visiting Ph.D. fellow at Mobile & Cloud Lab, Institute of Computer Science, Faculty of Science and Technology, University of Tartu, Estonia, under the Dora plus grant provided by the Archimedes Foundation, Estonia. He received his Master in Technology and Bachelor in Technology from the Department of Computer Science and Engineering at JNTUA, Ananthapuramu, with Distinction in 2014 and 2012.

Title & Abstract

**Unleashing the Potential of
Distributed Computing Continuum Systems**

A distributed compute continuum system (DCCS) makes use of interconnected devices to harness collective computing power. As part of this work, unlearning is categorized into monitoring and governing devices, representation learning is used to extract insights, and intelligent data protocols are developed for efficient data exchanges. Effective monitoring ensures that devices operate effectively, or detects potential bottlenecks, which are addressed through governing models. Representation learning can extract meaningful insights from all DCCS data sources, enabling more efficient knowledge extraction and decision-making systems. Further, intelligent data protocols within DCCS facilitate efficient data communication, coordination, and synchronization among the participating devices according to the system's condition. These protocols not only make the system more autonomous but also address several challenges including congestion control, dynamic message expiry, prioritization and message filtering in different data protocols.

16 Speaker

Dr. Victor Casamayor Pujol
Vienna University of Technology

Dr. Victor Casamayor Pujol is a project assistant in the Distributed Systems Group at TU Wien. In 2020 he obtained his PhD in ICT by Universitat Pompeu Fabra in Barcelona, Spain. He has a master in Intelligent Interactive Systems by UPF and a specialized master in space systems engineering (TAS-Astro) by ISAE in Toulouse, France.

He has experience working in diverse disciplines. He worked for the Centre National D'Etudes Spatiales (CNES) as a propulsion engineer, and during his Ph.D. he focused on the intersection between robotics and the RFID technology. Currently, his research interests are in self-adaptive methodologies for computing continuum systems, including machine learning techniques and service level objectives (SLO) modeling.

Title & Abstract

Self-adaptation in Distributed Computing Continuum Systems

Distributed computing continuum systems are required to enable the future applications that we all have in mind, from autonomous driving to holographic interactions. My research agenda focuses on developing methods and solutions to transform a geographically distributed fabric of computational resources into a self-adaptive multi-level entity that can adapt to the application needs as well as to the changes in its environment to keep the application running as expected.

17 Speaker

Prof.Dr. Qinghua Liu
Jiangsu University of Science and Technology

Prof. Liu Qinghua is a Professor at JUST of PRC, working in the Computer Faculty. Qinghua is also chair of AI technical group of World Transportation committee. Qinghua got his Ph.D. in 2008 from SEU, with a thesis: "Road Roughness Acquisition system Design based on Wheel force transducer". His research interests include Automobile electronics, intelligent transportation, Deep learning Algorithm, etc.

Over the last decade, Qinghua has been involved with a few large research projects related to the Internet of Things, Deep learning, and Cloud Computing, such as a national natural foundation project of China. Qinghua also presented many research papers in this field.

Title & Abstract

Automobile loaded Road data acquisition equipment based on Cloud computing

Road data acquisition system is a vital equipment for road build or maintain. But most machine can only acquire simple parameter. In this talk, we introduce an Auto loaded Road data acquisition equipment based on Cloud computing, which can get multiple parameters of road. The design framework is also introduced.

18 Speaker

Dr. Minxian Xu
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences

Dr. Minxian Xu is currently an Associate Professor at Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences. He received the BSc degree in 2012 and the MSc degree in 2015, both in software engineering from University of Electronic Science and Technology of China. He obtained his PhD degree from the University of Melbourne in 2019. His research interests focus on resource optimization in cloud computing and efficient management for microservice-based applications. He has co-authored 50+ peer-reviewed papers published in prominent international journals and conferences, such as ACM CSUR, ACM TOIT, IEEE TSUSC, IEEE TNSM, IEEE TCC, IEEE TASE and IEEE TGCN, including 2 ESI Highly Cited papers. These research work has attracted 1800+ citations (Google Scholar data). His Ph.D. Thesis was awarded the 2019 IEEE TCSC Outstanding Ph.D. Dissertation Award.

Title & Abstract

Efficient Autoscaling of Microservices with QoS Assurance

The emerging trend towards moving from monolithic applications to microservices has been widely adopted in modern distributed systems and applications, which shifted the traditional applications into light-weight, fine-grained and self-contained microservices. This talk first highlights the main sources of resource inefficiencies for microservice-based system, and then introduces the challenges in addressing the efficient management of microservices with QoS assurance. Finally, some state-of-the-art approaches based on autoscaling microservices to assure QoS will be discussed.

USEFUL INFORMATION

I Attention for All Sessions

1. Please take your Guest Card with you for all the sessions of the Confrernce.If it is lost, please contact the organizer.
2. Please ues the simultaneous interpretation equipment properly and put it back on your seat when sessions end.
3. Please turn off your mobile phone or adjust to the vibration mode during each session and smoking is not permitted.
4. Please take care of your laptop, mobile phone and other personal belongings.

II Date and Venue

1. Date: July 21st, 2023 (08:30—18:05)
2. Venue: Nanjing Parkview Dingshan Hotel, No. 90, Chahar Road, Gulou District, Nanjing, Jiangsu Province, China

III Lunch Arrangement

Please dine at Nanjing Parkview Dingshan Hotel with a meal coupons from 12:00-13:30 on July 21st.

IV Contact Information

Contact: Ms. Dora (Rui) Xu

Tel: +(86)15720617381

E-mail: rui.xu@schinper.com