2026 International Symposium on AI for Industry

2026工业智能国际学术研讨会

Inauguration Ceremony of International Joint Laboratory of AI for Industry

工业智能国际联合实验室成立仪式

PROGRAM BOOK

School of Data Science and Institute of Intelligent Chemical Engineering, Qingdao University of Science and Technology

May 17-19, 2026 **Qingdao, CHINA**

2026 International Symposium On AI for Industry Program Committee

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Prof. Wanquan Liu, Sun Yat-sen University, China

Prof. Zhigang Zeng, Huazhong Univ. of Sci. & Tech., China

Prof. Zhiwei Gao, Northumbria University, UK

Accommodation:

Haitian Financial Center Hotel （海天金融中心酒店）

No. 29 Xianxialing Road, Laoshan District, Qingdao, China

(青岛市崂山区仙霞岭路29号) TEL: +86- 0532-87057777

Venue: The 3rd Floor，Laoshan Meeting Room （3楼，崂山厅）

Welcome Message from the Directors of International Joint Lab of AI for Industry (LAII)

On behalf of the School of Data Science and the Institute of Intelligent Chemical Engineering, we are pleased to welcome you to Qingdao for the 2026 International Symposium on AI for Industry.

This symposium is devoted to contemporary developments in industrial artificial intelligence, with particular emphasis on data-driven large scale data analytics, process optimization and control of complex industrial systems, lightweight learner building for edge-computing based applications, bringing together current work on digital twin technologies, intelligent decision-making, and representation learning, alongside emerging paradigms such as core techniques, industrial foundation models and embodied intelligence. The symposium aims to facilitate rigorous academic exchange, to promote ML-based theoretical and methodological foundations underpinning AI-enabled industrial systems.

The symposium will take place from 17 to 19 May 2026 in Qingdao, a coastal city where European-style architecture stands alongside a modern skyline, forming a rich confluence of cultures. By the sea in the early days of spring, the symposium offers not only a forum for academic exchange, but also an occasion to establish new connections and broaden intellectual engagement across the international research community. Beyond the sessions, we invite you to experience the distinctive character of Qingdao, including its renowned Tsingtao beer, emblematic of the spirit of the city.

We wish the symposium every success and hope that your stay in Qingdao will be both enjoyable and memorable.

Program

May 17	08:00–20:00	Registration and Reception Dinner	
May 18	08:30–08:40	Inaugural Address I	Party Secretary Tianmei Yang, QUST
	08:40–08:50	Inaugural Address II	Vice President of Skoltech Grigory Kabatiansky,
	08:50–09:00	Inaugural Address III	Provincial/Municipal Government Representative
	09:00–09:10	Unveiling Ceremony	Vice Presidents of QUST and Skoltech, Directors of LAII, Ivan and Dianhui
	09:15–9:30	Coffee Break	
	9:45–10:45	Intelligent Integrated System for Optimal Decision-making and Control Based on End-edge-cloud Collaboration	Tianyou Chai
	11:00–12:00	Laboratory Development Plan Discussion	Lab Members & Invited Experts
	12:00–13:30	Lunch	
	13:30–14:30	Informed Machine Learning: A Holistic Data – Knowledge Design Environment	Witold Pedrycz
	14:45–15:45	Fundamental Research on Digital Twin Qualification and AI Assurance for Operational Safety-Critical Systems	Shen Yin
	15:45–16:00	Coffee Break	
	16:10–16:50	Active Learning for Regression Problems	Dongrui Wu
	17:00–17:40	Industrial Foundation Model & Embodied Intelligence & Digital Genealogy: Driving the Future Industrial world	Lei Ren
	18:00–20:00	Banquet	

Program

May 19	08:30–09:10	Autonomous Intelligent Systems Inspired by Associative Memory Mechanisms	Zhigang Zeng
	09:20–10:00	Applications of The Fully Actuated System Theory on Nonlinear Control of Robots and UAVs	Wanquan Liu
	10:00–10:20	Coffee Break	
	10:20–11:00	Brief Introduction to AI and Several Algorithms for Optimization Problems	Tingwen Huang
	11:10–11:50	Empowering Multi-modal Large Language Models with Active Perception Using Reinforcement Learning	Chunhua Shen
	12:00–13:30	Lunch	
	13:30–14:10	Population Dynamics, Mean-Field Game, and Applications	Tielong Shen
	14:20–15:00	Can I Trust You? A Statistical Measure of Trust in Generative AI	Ivan Tyukin
	15:00–15:20	Coffee Break	
	15:20–16:00	Monitoring, Fault Diagnosis and Resilient Control for Industrial Systems	Zhiwei Gao
	16:10–16:50	Feasibility Comparisons Between Stochastic Configuration Networks and MLP for Industrial AI	Dianhui Wang
	17:00-18:00	Business Networking and Technical Discussion	
	18:00	Closing Dinner	

Keynote Speech: May 18, 2026 09:45-10:45

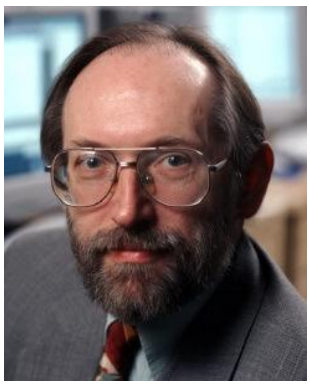
Title: Intelligent Integrated System for Optimal Decision-making and Control Based on End-edge-cloud Collaboration

Tianyou Chai
Professor of Northeastern University, China

Abstract: To address the challenges that online optimization of operational decision-making and control in complex industrial systems cannot be realized, this talk proposes a unified structure and algorithm for integrated operational optimal decision-making and control, by combining control, optimization, and prediction with AI technology. It also proposed a parameter self-learning and self-optimizing algorithm for operational optimal decision-making and control integrating systems, by combining mechanism analysis with deep learning, and digital twin with reinforcement learning. An intelligent integrated system for optimal decision-making and control based on end-edge-cloud collaboration is developed, by combining the proposed method and the end-edge-cloud collaboration technology of Industrial Internet. The system includes the end-optimal decision-making and control system under actual operation, as well as the cloud-edge collaborative parameter self-learning and self-optimizing system for decision-making and control system. The parameter self-learning and self-optimizing system in digital space collaborates with the optimal decision-making and control system under actual operation. Thus, the end-operational optimal decision-making and control system realizes self-learning and self-optimization. The system has been successfully applied in the energy intensive equipment — fused magnesium furnace and achieved remarkable results in the reduction of carbon emission.

BIO: Tianyou Chai received the Ph.D. degree in control theory and engineering in 1985 from Northeastern University, Shenyang, China, where he became a Professor in 1988. He is the founder and Director of the Center of Automation, which became a National Engineering and Technology Research Center and a State Key Laboratory. He is a member of Chinese Academy of Engineering, IFAC Fellow and IEEE Fellow. He has served as director of Department of Information Science of National Natural Science Foundation of China from 2010 to 2018. His current research interests include modeling, control, optimization and integrated automation and intelligence of complex industrial processes.
He has won 5 prestigious awards of National Natural Science, National Science and Technology Progress and National Technological Innovation, the 2007 Industry Award for Excellence in Transitional Control Research from IEEE Multiple-conference on Systems and Control, and the 2017 Wook Hyun Kwon Education Award from Asian Control Association.

Keynote Speech: May 18, 2026 13:30-14:30



Title: Informed Machine Learning: A Holistic Data – Knowledge Design Environment

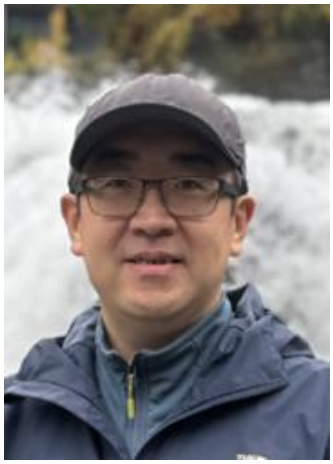
Witold Pedrycz
Professor of the University of Alberta, Canada

Abstract: At the center of the ML methodology lies a default assumption that the data fully represent the problem to be solved (e.g., classification or prediction). Enormous masses of data are the blessing and the curse. We look at the problem and produce a solution through the lens of data; in many cases, this may lead to the data blinding effect. We advocate that a holistic knowledge-data development perspective is urgently needed.

An Informed ML (IML) has emerged as a new and promising direction of research addressing these needs. In brief, IML is sought as a methodology in which data and knowledge are used in unison to design ML systems. From the design perspective encountered in the ML learning environment, data and knowledge are radically different. Data are numeric and precise. Knowledge is general and usually expressed at the higher level of abstraction (generality). Knowledge and data emerge at different levels of information granularity. In this talk, we deliver a comprehensive taxonomy of main pursuits of IML and link them with the main ways the knowledge is represented. A historical perspective is offered by studying the symbolic and subsymbolic processing encountered in successive decades of AI.

BIO: Witold Pedrycz is a Professor at the University of Alberta in Canada, Foreign Member of the Polish Academy of Sciences, Fellow of the Royal Society of Canada, Fellow of the Royal Canadian Academy of Science, and Life Fellow of the IEEE. His research areas include computational intelligence, fuzzy systems, granular computing, machine learning, and data mining. He proposed a knowledge-driven machine learning (KD-ML) paradigm and the concept of knowledge landmarks, with a focus on research on the integration of data and knowledge. He is a Recipient of the Norbert Wiener Prize awarded by the IEEE Systems and Control Society, the IEEE Canada Computer Engineering Medal, the Kilham Prize awarded by the European Centre for Soft Computing, the Fuzzy Pioneer Award awarded by the IEEE Computational Intelligence Society, and the 2019 Distinguished Service Award awarded by the IEEE System and Control Society. He is a highly recognized scholar around the world, with h-index 144 according to Google Scholar in 2026. He served many reputable journals as Editor-in-Chief and Associate Editor, such as IEEE Transactions on Fuzzy Systems, IEEE Transactions on Systems, Man, and Cybernetics, Information Sciences and WIREs Data Mining and Knowledge Discovery (Wiley).

Keynote Speech: May 18, 2026 14:45-15:45



Title: Fundamental Research on Digital Twin Qualification and AI Assurance for Operational Safety-Critical Systems

Shen Yin

DNV Endowed Professor of Norwegian University of Science and Technology, Norway

Abstract: This talk addresses digital twin qualification and AI assurance, with a focus on general principles, foundational theories, and methodological frameworks.

A structured approach to digital twin qualification is introduced, providing a systematic characterization from the perspectives of fidelity, timeliness, integration, and standard conformity, with the aim of enabling consistent analysis, evaluation, and iterative refinement. For AI assurance, an extended framework based on ISO/IEC TR 5469 is developed, focusing on operational-stage dynamics and evolution mechanisms, including performance evaluation, drift detection, and corresponding decision strategies.

The work builds on system modelling and reliability analysis, focusing on consistent formulations and general structures.

BIO: Shen Yin is the DNV Endowed Professor at the Norwegian University of Science and Technology (NTNU). His research focuses on the fundamental principles and methodological development of system modelling, fault diagnosis, prognosis, and reliability analysis. In recent years, he has further contributed to general frameworks and foundational theories for digital twin qualification and artificial intelligence assurance.

He currently serves as Co-Editor-in-Chief of IEEE Transactions on Industrial Informatics (since 2023), Chair of the Fellow Evaluation Committee of the IEEE Reliability Society (2026), and as a member of the Administrative Committee (AdCom) of the IEEE Industrial Electronics Society. He also served as the founding Chair of the Technical Committee on Data-Driven Control and Monitoring of the IEEE Industrial Electronics Society (2013–2016).

He has been named a Highly Cited Researcher by Clarivate for the period 2016–2025. He is a Fellow of the IEEE and a member of the Norwegian Academy of Technological Sciences (NTVA).

Talk: May 18, 2026 16:10–16:50

Title: Active Learning for Regression Problems

Dongrui Wu
Professor of Huazhong University of Science and Technology, China

Abstract: Active learning for regression (ALR) optimally selects a small number of samples sequentially from a large pool of unlabeled samples to label, so that a more accurate regression model can be constructed under a given labeling budget. It can be used to significantly reduce the labeling cost of many industrial problems. This talk will introduce the three basic principles in ALR, i.e., informativeness, representativeness, and diversity, and several state-of-the-art ALR approaches.

BIO: Dongrui Wu (IEEE Fellow) received a B. E in Automatic Control from the University of Science and Technology of China, Hefei, China, in 2003, an M.Eng in Electrical and Computer Engineering from the National University of Singapore in 2006, and a PhD in Electrical Engineering from the University of Southern California, Los Angeles, CA, in 2009. He is now Professor at School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China.

Prof. Wu's research interests include brain-computer interface, machine learning, computational intelligence, and affective computing. He has more than 200 publications (18000+ Google Scholar citations; h=70). He received IEEE Computational Intelligence Society Outstanding PhD Dissertation Award in 2012, IEEE Transactions on Fuzzy Systems Outstanding Paper Award in 2014, IEEE Systems, Man and Cybernetics Society Early Career Award in 2017, USERN Prize in Formal Sciences in 2020, IEEE Transactions on Neural Systems and Rehabilitation Engineering Best Paper Award in 2021, Chinese Association of Automation (CAA) Early Career Award in 2021, Ministry of Education Young Scientist Award in 2022, First Prize of the CAA Natural Science Award in 2023, IEEE Transactions on Biomedical Engineering Best Paper Award in 2025, and IEEE/CAA Journal of Automatica Sinica Norbert Wiener Review Award in 2025. His team won National Championship of the China Brain-Computer Interface Competition in seven successive years (2019-2025). Prof. Wu is the Editor-in-Chief of IEEE Transactions on Fuzzy Systems.

Talk: May 18, 2026 17:00–17:40

Title: Industrial Foundation Model & Embodied Intelligence & Digital Genealogy: Driving the Future Industrial World

Lei Ren

Professor of Beihang University, China

Abstract: This report will explore the key technological directions at the intersection of "artificial intelligence and new industrialization". It summarizes the prominent technologies emerging from the integration and innovation of the Industrial Internet and AI 2.0; elaborates on the new definition and implications, system architecture, key technologies, and typical applications of industrial foundation models in the context of the AI 3.0 era driven by foundation models and intelligent agents; meanwhile, it introduces the models, system architecture, and typical applications of industrial embodied intelligence. Furthermore, it proposes the theoretical and technological framework of the "digital genealogy" to support industrial foundation models and world models for embodied intelligence. Finally, it offers a perspective on future development directions.

BIO: Lei Ren is the recipient of the National Science Fund for Distinguished Young Scholars in the field of industrial internet and serves as the Chief Scientist of the National Key Research and Development Program in the key special project on industrial software. He is a Distinguished Professor at Beihang University, in both the School of Automation Science and Electrical Engineering and the School of Software, and serves as the Director of the Academic Committee of the National Key Laboratory of Intelligent Manufacturing of Complex Products. He was the first to propose the theoretical and technological framework for industrial foundation models in the academic community both domestically and internationally, and established the first national standard system in this field. He has led over 30 national and provincial-level projects, including major national science and technology special projects, National Key Research and Development Programs, and Major Research Plans of the National Natural Science Foundation of China. He has published over 100 papers in prestigious international journals such as IEEE Transactions, with more than 10,000 citations, and has been recognized in the Stanford University of World's Top 2% Scientists for lifetime impact. As the principal investigator, he has received five first-prize provincial and ministerial awards. He serves as a committee member for more than ten domestic and international professional organizations, including IEEE, CCF, CAAI, and CAA, and serves on the editorial boards of IEEE TNNLS, TMECH, Science China, and etc. He has served as the chair of numerous IEEE and other academic conferences, both domestically and internationally, and has delivered over 100 invited keynote and plenary presentations.

Talk: May 19, 2026 08:30-09:10

Title: Autonomous Intelligent Systems Inspired by Associative Memory Mechanisms

Zhigang Zeng
Professor of Huazhong University of Science and Technology, China

Abstract: In the current wave of LLM-driven intelligence, while scaling parameters and computational power have significantly enhanced task-specific performance, machines still rely heavily on massive datasets and high energy consumption. These systems often lack online adaptability in open environments, leaving a clear gap in achieving autonomous intelligence characterized by contextual understanding and emotional interaction. Taking the "Four alignments between weak and strong AI" as an entry point, this talk reviews key correspondences between AI and neurobiological mechanisms: deep networks vs. neuron-synaptic structures; Attention vs. classical conditioning; Reinforcement Learning vs. operant conditioning; and Embodied Intelligence vs. the cerebro-cerebellar closed-loop. We further propose that dynamic associative memory may serve as a critical pillar for enhanced autonomy and self-adaptation. Focusing on our research in memristor-based associative memory networks, we analyze the simulation of multisensory association and the evolution of emotional generation. This framework could expand to encompass richer modalities (such as vision, audition, touch, smell, and taste) and higher-level cognitive functions. By integrating with brain-inspired algorithms (such as SNN and HTM) and Computing-in-Memory (CIM) chips, this research aims to empower autonomous unmanned systems, affective robotics, and intelligent wearables.

BIO: Dean of the School of Artificial Intelligence and Automation at Huazhong University of Science and Technology (HUST), Director of the Key Laboratory of Image Processing and Intelligent Control, Ministry of Education, and IEEE Fellow. He received his Ph.D. degree in Systems Analysis and Integration from HUST in June 2003. He has served on the editorial boards of several top-tier journals, including IEEE Transactions on Neural Networks, IEEE Transactions on Cybernetics, IEEE Transactions on Fuzzy Systems, Cognitive Computation, Neural Networks, Applied Soft Computing, Acta Automatica Sinica, Control Engineering of China, Journal of Systems Engineering and Electronics, and Control Theory & Applications. He has received numerous prestigious awards, including the First Prize of Hubei Province Natural Science Award, the First Prize of Hubei Province Scientific and Technological Progress Award, the First Prize of the Natural Science Award for Outstanding Scientific Research Achievements in Higher Education Institutions from the Ministry of Education, and the Second Prize of the National Science and Technology Progress Award.

Talk: May 19, 2026 09:20-10:00

Title: Applications of The Fully Actuated System Theory on Nonlinear Control of Robots and UAVs

Wanquan Liu
Professor of Sun Yat-sen University, China

Abstract: In this seminar, I will establish some novel strategies for robot control within the recently proposed fully actuated system framework. Some critical challenges, including predefined-time consensus, input constraints, nonholonomic constraints, and heterogeneous cooperation, are systematically addressed. Firstly, for omnidirectional mobile robots operating in complex environments, a predefined-time consensus control scheme is developed under input constraints, nonholonomic constraints, and collision-free formation requirements. A novel fully actuated predefined-time behavioural control strategy is developed by integrating a predefined-time cooperative protocol with a null-space-based behavioural control mechanism, thereby enabling distributed formation control. Secondly, for tendon-driven manipulators, a fully actuated control framework based on model predictive control (MPC) is established to address input constraints, strong coupling, and vibration induced by high-frequency torque variations. In both cases, by exploiting the fully actuated transformation, complex nonlinear dynamics are reformulated into a tractable linear form, significantly reducing controller design complexity. Finally, for heterogeneous air–ground cooperative systems, a unified fully actuated modelling and control approach is developed to address dynamic discrepancies among heterogeneous robots and to reduce reliance on accurate nonlinear models. By transforming the dynamics of unmanned aerial vehicles and ground vehicles into a unified, fully actuated representation, distributed consensus-based formation control can be achieved, resulting in better coordination accuracy and system stability. In summary, a unified fully actuated system control framework is established for some typical robot control problems, to systematically address critical issues brought by the nonlinear complexity.

BIO: Wanquan Liu (Senior Member, IEEE): He is a Chair Professor in the School of Intelligent Systems Engineering at Sun Yat-sen University. He has been awarded the Excellent Pearl River Scholar by Guangdong Province in 2022, and received the honour of National Distinguished Scholar conferred by the National Education Committee of China in 2023. He has published over 420 papers in reputed journals and international conferences, with more than 8,400 citations and an h-index of 43.

Talk: May 19, 2026 10:20–11:00

Title: Brief Introduction to AI and Several Algorithms for Optimization Problems

Tingwen Huang
Professor of Shenzhen University of Advanced Technology, China

Abstract: A brief introduction to the development of artificial intelligence includes the 2012 deep neural network winning the ImageNet image recognition competition, and the 2016 AlphaGO victory over the Go world champion, ChatGPT. Algorithms play a critical role in artificial intelligence. Then, two algorithms for optimization problems are introduced. One is to find the optimal solution for the energy trading problem of microgrid based on reinforcement learning algorithm. No information about the distribution of proceeds is available a priori, and the strategy chosen by each microgrid is private to the adversary. To address this challenge, a repetitive game-based new energy trading framework enables each microgrid to individually select a strategy to maximize his/her average income. The other is an optimization algorithm based on distributed asynchronous broadcasting, which solves the distributed convex optimization problem on unbalanced directed multi-agent (without central coordinator) networks with inequality constraints. Not only does the algorithm allow agent updates to be asynchronous in a distributed manner, but the step sizes of all agents are uncoordinated. An important feature of the proposed algorithm is that it deals with constraint optimization problems in the case of unbalanced directed networks, the communication of which may be affected by possible link failures.

BIO: Tingwen Huang received his B.S. degree from Southwest Normal University (now Southwest University), China, 1990, his M.S. degree from Sichuan University, China, 1993, and his Ph.D. degree from Texas A&M University, College Station, Texas, 2002. After graduating from Texas A&M University, he worked as a Visiting Assistant Professor there. Then he joined Texas A&M University at Qatar (TAMUQ) as an Assistant Professor in August 2003, then he was promoted to Professor in 2013. Dr. Huang’s research areas include neural networks, chaotic dynamical systems, complex networks, optimization and control, and smart grid. He is a Fellow of IEEE and IAPR (International Association for Pattern Recognition), and Changjiang Chair Professor. He is a Fellow of The World Academy of Sciences.

Talk: May 19, 2026 11:10–11:50

Title: Empowering Multi-modal Large Language Models with Active Perception Using Reinforcement Learning

Chunhua Shen
Professor of Zhejiang University, China

Abstract: Active vision, or active perception, denotes the process of proactively choosing where and how to perceive to collect task-relevant information, serving as a pivotal element for efficient perception and decision-making in both humans and advanced embodied agents. Recently, Multimodal Large Language Models (MLLMs) have attracted widespread attention as core planning and decision-making modules in robotic systems. Nevertheless, despite the significance of active perception in embodied intelligence, there has been minimal exploration into how to endow MLLMs with active perception capabilities or enable them to learn such abilities.

In this talk, we first present a systematic definition of MLLM-based active perception tasks. We note that the zoom-in search strategy of the recently proposed GPT-o3 model can be considered a special case of active perception, yet it still faces drawbacks of low search efficiency and imprecise region selection. To tackle these issues, we propose ACTIVE-O3, a reinforcement learning-based training framework built on GRPO, specifically designed to equip MLLMs with active perception capabilities.

BIO: Chunhua Shen has been a University Chair Professor at Zhejiang University since 2022, where he serves as Deputy Director of the State Key Laboratory of CAD&CG and leads research in artificial intelligence, machine learning, and computer vision. Prior to joining Zhejiang University, he spent nearly two decades in Australia, holding key positions including: Principal Applied Scientist at Amazon Australia, Full Professor at the University of Adelaide and the Australian Institute for Machine Learning, and Chief Investigator at the Australian Centre for Robotic Vision, National ICT Australia (NICTA), and the Australian National University. His research centers on computer vision, statistical machine learning, and multi-modal models, with influential contributions to anchor-free object detection (e.g., FCOS) and deep learning fundamentals. As a highly cited scholar, his Google Scholar citations exceed 100,000 as of May 2026, with an H-index of 152. Several of his research outputs, including image parsing and object detection technologies, have been successfully deployed on tens of millions of mobile devices and applied in autonomous driving scenarios. His honors include the Australian Research Council Future Fellowship (2012) and the Chang Jiang Scholars Distinguished Professorship (2022).

Talk: May 19, 2026 13:30–14:10

Title: Population Dynamics, Mean-Field Game, and Applications

Tielong Shen
Professor of Sophia University, Japan

Abstract: This talk will focus on recent topics in mean-field game of finite-state dynamical systems. After a short review on motivated examples, game formulation will be explained for the dynamical systems with a mixed state space of finite state and continuous domain. Also, potential in dealing with a large-population of agents with logical dynamics will be illustrated from the perspective of mean-field game-based approach.

BIO: Shen Tielong obtained a doctoral degree in engineering from Sophia University, Tokyo, in March 1992. He began teaching at the Faculty of Science and Technology of Sophia University in April of the same year. He has held positions as Associate Professor, Assistant Professor, Associate Professor, and Professor, as well as the Director of the Institute of Earth Environment. Currently, he holds the title of Honorary Professor. Additionally, he serves as a visiting professor at the Next-Generation Automotive Power System Research Center of Chiba University in Japan. He will assume his current position starting in 2024. His primary research areas include the theory of dynamic system control and its applications in automotive power systems. He has been actively involved with relevant associations in the field of automatic control both domestically and internationally. He served as the President of the 2015 and 2021 annual conferences of the Society for Instrumentation and Control of Japan (SICE) and as the President of the 6th and 7th International Conference on Engine/Power System Control, Modeling, and Simulation (IFAC ECOMS 2021) of the International Federation of Automatic Control (IFAC). Over the past two decades, Dr. Shen has continuously undertaken numerous key projects funded by the Japan Society for the Promotion of Science (JSPS) and has served as the leader or co-leader of several scientific and government-sponsored projects between Japan, South Korea, and China. In 2021, Professor Shen received the Eighth Outstanding Contribution Award at the China Control Conference and was named a Fellow of SICE.

Talk: May 19, 2026 14:20–15:00

Title: Can I Trust You? A Statistical Measure of Trust in Generative AI

Ivan Tyukin
Professor of Skolkovo Institute of Science and Technology, Russia

Abstract: Generative AI has been rapidly evolving into a common and inherent part of modern society. It greatly enhances productivity in a host of sectors related to coding, processing textual information, and is increasingly embedded in everyday life through tools for communication, search, learning, and decision making. At the same time, as the adoption rate of technology grows, so is the concern around the challenge of trust in generative AI. Hallucinations in generative AI represent one of the most critical and fundamental challenges in the context of trustworthiness of modern AI systems. In this talk, we will delve into the problem of AI hallucinations and will examine how to assess the quality and trustworthiness of generative AI outputs in the absence of ground truth or gold-standard verification methods.

BIO: Ivan Y. Tyukin received the M.Sc., Ph.D., and D.Sc. (Habilitation) degrees from Saint Petersburg Electrotechnical University, Saint Petersburg, Russia, in 1998, 2001, and 2006, respectively. After the Ph.D. degree, he worked as a Research Scientist at RIKEN Brain Science Institute, Wako, Japan. Since then, he became a Lecturer in applied mathematics, a Reader, and a Professor in applied mathematics in 2012, 2014, and 2018, respectively. From 2019 to 2021, he was an Adjunct Professor at the Norwegian University of Science and Technology (NTNU), Trondheim, Norway. In 2022, he moved to King's College London, London, U.K., as a Professor of mathematical data science and modeling at the Department of Mathematics. In 2024 he joined Skolkovo Institute of Science and Technology. His research interests span mathematical modeling, control, optimization, data analysis, and mathematical foundations of AI and machine learning. Prof. Tyukin was awarded an RCUK Academic Fellowship at the University of Leicester, Leicester, U.K., in 2007. In 2021, he was awarded a UKRI Turing AI Acceleration Fellowship to work on mathematics underpinning the development of robust, stable, and resilient AI. He is an Editorial Board Member of Industrial Artificial Intelligence and Computational Mathematics and Modeling and an Editor of Communications in Nonlinear Science and Numerical Simulation.

Talk: May 19, 2026 15:20–16:00

Title: Monitoring, Fault Diagnosis and Resilient Control for Industrial Systems

Zhiwei Gao
Professor of Northumbria University, United Kingdom

Abstract: Industrial systems are becoming more complex and expensive, but with less tolerance on system performance degradation. Industrial systems are prone to faults, due to long-time operation, harsh environments, and unexpected accidents. Therefore, there is a strong motivation to develop effective monitoring, diagnosis and tolerant control techniques to identify a fault at early stage and take appropriate decision and control actions to isolate or accommodate a fault, to improve the readability, safety, availability and productiveness of the industrial system. In this talk, the concept of the fault, various diagnosis techniques including model-based, signal-based, and knowledge-based are introduced, and some application examples of diagnosis and control are discussed.

BIO: Prof. Zhiwei Gao received the BEng degree in industrial automation and MEng and PhD degrees in systems engineering from Tianjin University respectively in 1987, 1993, and 1996. From 1996 to 1998, he was a postdoctoral researcher at Nankai University. In 1998, he joined Tianjin University as Associate Professor and was promoted to Full Professor in 2001. In 2004, he was awarded the Alexander von Humboldt Research Fellowship, working in the University of Duisburg-Essen. From 2006, he held research and academic positions respectively in the University of Manchester, University of Leicester, University of Liverpool, Newcastle University, and Northumbria University. His research interests include estimation and filtering, diagnosis and control, machine learning, digital twins, wind energy systems, electric vehicles, offshore energy, power electronics and low-carbon industrial systems. In 2023, he was elevated to IEEE Fellow for contributions to diagnosis and control for wind turbine systems. In 2024, he was awarded the Royal Academy of Engineering/Leverhulme Trust Research Fellow, devoting to health management for wave energy converters. He was the recipient of the 2025 Highly Cited Researcher Award from Clarivate. He is currently the Co-Editor-in-Chief of IEEE Transactions on Industrial Informatics. He was academic editor of IEEE Transactions on Automatic Control, IEEE Transactions on Industrial Electronics, and Renewable Energy etc.

Talk: May 19, 2026 16:10–16:50

Title: Feasibility Comparisons Between Stochastic Configuration Networks and MLP for Industrial AI

Dianhui Wang
Professor of Qingdao University of Science and Technology, China

Abstract: The first part of this talk reviews the development of the well-known error back-propagation (BP) algorithm for training neural networks and its impact on deep learning, followed by a list of weaknesses of such a learning technique for industrial data modelling. The second part gives an alternative solution for building neural networks, introducing randomized algorithms, and pointing out some issues related to this class of learning techniques. Then, data-driven deep stochastic configuration networks are presented with some demonstrations and industrial applications. In the end, we summarize some characteristics of BP algorithms and stochastic configuration (SC) algorithms and make comparisons, showing the feasibility and limits of these learning techniques for industrial AI applications.

BIO: Dianhui Wang received his PhD in industrial automation from Northeastern University, March 1995. From September 1995 to August 1997, he was a postdoctoral research fellow at the Nanyang Technological University, Singapore. From June 1998 to June 2001, he worked as a researcher at the Hong Kong Polytechnic University, Hong Kong. From July 2001 to December 2020, he worked at La Trobe University, Australia. Since 2017, he has been visiting Professor at the State Key Laboratory of Integrated Process Automation in Northeastern University. From July 2021 to December 2024, he worked at the Institute of Artificial Intelligence of China University of Mining and Technology, serving as Dean and Professor. In April 2025, he joined the School of Data Science at Qingdao University of Science and Technology, working as a distinguished Professor and Director of the Institute of Intelligent Chemical Engineering, leading the development of the “AI for Industry”. He is a founding Editor-in-Chief of the journal “Industrial Artificial Intelligence” and serves as an associate editor for several international journals, including “IEEE Transactions on Fuzzy Systems,” “Information Sciences,” “WIREs Data Mining and Knowledge Discovery,” and has previously served as an associate editor for “IEEE Transactions on Neural Networks and Learning Systems,” “IEEE Transactions on Cybernetics,” and “Artificial Intelligence Review”.

Registration & Local Information

- The Symposium offers free registration with a deadline of May 10th, which can be done by scanning the following code.

- Local Information on the Hotel location map road from the railway stations and the airport, shopping malls and some popular tourist attractions.

May Fourth Square & Olympic Sailing Center Palace

五四广场与奥帆中心

Catholic Church

天主教堂

Site of German Governor's

德国总督府旧址