The 20th International Workshop on Complex Systems and Networks

第20届复杂系统与网络国际研讨会（IWCSN2026）

Meeting Handbook

会议手册

Oct. 30 —Nov.1，2026

2026年10月30日—11月1日

Hangzhou·China

中国·杭州

I. Conference Information

Distinguished Leaders and Guests,

Welcome to the 20th International Workshop on Complex Systems and Networks . To ensure a smooth stay and productive participation throughout the conference, we would like to bring the following reminders to your attention:

（I）Code of Conduct for the Conference

1. Please abide by the conference rules and follow the unified arrangements of the organizing committee.

2. Please attend all conference activities on time. If you cannot attend due to special circumstances, please notify the conference secretariat promptly.

3. Please turn off your mobile phones or set them to silent (vibrate) mode in the venue.

（II）Conference Venue & Accommodation

Venue: Baimahu Jianguo Hotel, Binjiang District, Hangzhou

(Address: No. 336 South Changjiang Road, Binjiang District, Hangzhou)

（III）Conference Catering

Meals during the conference are arranged uniformly by the organizing committee. For specific time and locations, please refer to the agenda or on-site notices.

（IV）Conference Contacts

Zhenyu Shan, Tel: 13810873373

Xinjie Xiu, Tel: 13701203868

一、会议须知

尊敬的各位领导、嘉宾：

欢迎您参加第20届复杂系统与网络国际研讨会（IWCSN2026），为保证您在会议期间的工作、生活顺利，提醒您以下事项：

（一）会议纪律要求

1.请自觉遵守会议纪律，服从大会统一安排。

2.请按时参加会议各项活动，如有特殊情况不能出席，请及时报告会务组。

3.会场内请关闭手机或调为静音（振动）模式。

（二）会议会场、住宿

地址：杭州市滨江区白马湖建国饭店（地址：杭州市滨江区长江南路336号）

（三）会议用餐

会议期间用餐由大会统一安排，具体时间及地点详见议程安排或会场通知。

（四）会议联系人

单振宇，电话13810873373

修心洁，电话13701203868

II. Workshop Program
二、日程简表

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<tr><td colspan="5">White Horse Lake Jianguo Hotel （白马湖建国饭店）, Hangzhou</td></tr>
<tr><td colspan="5">October 30, 2026
2026年10月30日</td></tr>
<tr><td colspan="5">Registration （Check-in Desk, 1st floor Lobby），Dinner （Vic's Coffee Shop, 1st floor）
报到注册（一楼大厅签到处），晚餐（一楼维克咖啡厅）</td></tr>
<tr><td colspan="5">October 31, 2026
2026年10月31日</td></tr>
<tr><td colspan="5">Opening Ceremony
开幕式</td></tr>
<tr><td rowspan="2">08:15~08:30</td><td colspan="2">Welcome speech given by Prof. Jinhu Lü and Prof. Guanrong Chen
致辞（吕金虎，陈关荣）</td><td rowspan="11">Chair: Qing Gao, Beihang University
主持：高庆 北京航空航天大学</td><td rowspan="11">Baimahu Banquet Hall, 2nd floor
二楼 白马宴会厅</td></tr>
<tr><td colspan="2">Group photo
合影</td></tr>
<tr><td colspan="3">Keynote Speech Session 1
主旨报告1</td></tr>
<tr><td>08:30~09:20</td><td>Guanrong Chen, City University of Hong Kong, Hong Kong
香港城市大学 陈关荣</td><td>From Lorenz System to Non-hyperbolic Chaotic Systems</td></tr>
<tr><td>09:20~10:10</td><td>Ljiljana Trajkovic, Simon Fraser University, Canada</td><td>Data Mining and Machine Learning for Analysis of Network Traffic</td></tr>
<tr><td>10:10~10:20</td><td colspan="2">Coffee Break
茶歇</td></tr>
<tr><td>10:20~11:10</td><td>Wenwu Yu, Southeast University, China
东南大学 虞文武</td><td>Theories and Applications of Distributed Optimization in Networks</td></tr>
<tr><td>11:10~12:00</td><td>Haris Skokos, University of Cape Town, South Africa</td><td>Numerical investigation of effective stability and chaos in the J2–Solar radiation pressure problem</td></tr>
<tr><td>12:00~13:30</td><td colspan="4">Lunch and break, Vic's Coffee Shop, 1st floor
午餐+休息（一楼维克咖啡厅）</td></tr>
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Invited Talk Session 特邀报告				
13:30~14:00	Shanling Dong, Zhejiang University, China 浙江大学 董山玲	Robust Cooperative Control of Constrained Networked Systems	Chair: Yongxiang Xia, Hangzhou Dianzi University 主持：夏永祥 杭州电子科技大学	Baimahu Banquet Hall, 2nd floor 二楼 白马宴会厅
14:00~14:30	Bo Chen, Zhejiang University of Technology, China 浙江工业大学 陈博	Distributed Estimation for Large-Scale Interconnected Systems: Stability Analysis via Riccati Difference Equation		
14:30~15:00	Cheng Song, Nanjing University of Science and Technology, China 南京理工大学 宋程	Boundary Coverage Control for Multi-Agent Systems without Connectivity Preservation		
15:00~15:30	Xiaofang Hu, Southwest University, China 西南大学 胡小方	From Lightweight Memristive Neural Networks to Multimodal Brain-Inspired Computing: Models, Architectures, and Systems		
15:30~15:45	Coffee Break 茶歇			
15:45~16:15	Xiaoqiang Ren, Shanghai University, China 上海大学 任肖强	Secure and Safe Optimization and Control of Cyber-Physical Systems	Chair: Zhihai Rong, Donghua University 主持：荣智海 东华大学	
16:15~16:45	Xiaochen Xie, Harbin Institute of Technology, Shenzhen, China 哈尔滨工业大学深圳 谢晓晨	Model-based and Data-driven Control of Periodic Systems: Multi-affine and Switching-inspired Approaches		
16:45~17:15	Duxin Chen, Southeast University, China 东南大学 陈都鑫	Predicting Dynamics of Ultra-Large Complex Systems by Inferring Governing Equations		
17:15~17:45	LIU Dong, Hong Kong Metropolitan University, Hong Kong 香港都会大学 刘东	Cascading Failure Modeling and Resilience Analysis in Complex Power Networks		
18:00~20:30	Dinner, Baimahu Banquet Hall B, 2nd floor 晚餐，二楼白马宴会厅B			

November 1, 2026 2026年11月1日				
Keynote Speech Session 2 主旨报告2				
08:30~09:20	C. K. Michael Tse, City University of Hong Kong, Hong Kong 香港城市大学 谢智刚	Inherently Unstable Negative Reactive Device for Power Applications	Chair: Qing Gao, Beihang University 主持：高庆 北京航空航天大学	Baimahu Banquet Hall, 2nd floor 二楼 白马宴会厅
09:20~10:10	Michael Small, The University of Western Australia, Australia	Reservoir Computing and Ordinal Encodings		
10:10~10:20	**Coffee Break** 茶歇			
10:20~11:10	Xiang Li, Fudan University, China 复旦大学 李翔	Complex Intelligence: Higher-order Interactions of Cavity, Brains, and More		
Closing Ceremony 闭幕式				
11:10~11:20	Conclusion speech given by Prof. Guanrong Chen and Prof. C. K. Michael Tse 致辞（陈关荣、谢智刚）			
11:20~13:00	**Lunch, Vic's Coffee Shop, 1st floor** 午餐，一楼维克咖啡厅			

III. Brief Biography



Title: From the Lorenz System to Nonhyperbolic Chaotic Systems

Speaker: Guanrong Chen(陈关荣), City University of Hong Kong, Hong Kong

Abstract: In this presentation, we begin with the classical Lorenz system to illustrate the fundamental mechanism underlying the emergence of chaos, namely, the intricate entanglement of stable and unstable manifolds in phase space. This phenomenon arises from the interplay between local divergence and global boundedness within the system. A key feature of this mechanism is rooted in the hyperbolic nature of the eigenvalues of the Jacobian matrix at the system's equilibrium points.

We then turn to several recently discovered nonhyperbolic chaotic systems. Like the Lorenz system, these are three-dimensional, first-order dynamical systems described by quadratic polynomial equations, possessing relatively simple analytical forms. Unlike the Lorenz system, however, they may have no equilibria at all, only stable equilibria, or even infinitely many equilibria. As a result, most traditional analytical tools, particularly those based on hyperbolic eigenvalues, become inapplicable.

Finally, we briefly discuss several other classes of nonhyperbolic chaotic systems, including systems with multi-scroll attractors, systems exhibiting multiple coexisting periodic attractors, and nonautonomous chaotic systems.

This presentation highlights some recent developments in chaos theory and aims to stimulate further interest, inquiry, and research in this rapidly evolving field.

Professor Guanrong Chen received his M.S. degree in Computational Mathematics from Sun Yat-sen University in Guangzhou, China, in 1981 and his Ph.D. degree in Applied Mathematics from Texas A&M University, USA, in 1987. He subsequently held faculty positions at Rice University and the University of Houston. Since 2000, he has been a chair professor at the City University of Hong Kong. Professor Chen was awarded honorary doctorates from Saint Petersburg State University, Russia, and the University of Normandy, France, respectively. He is a life fellow of the IEEE, a member of Academia Europaea and a fellow of The World Academy of Sciences.



Title: Data Mining and Machine Learning for Analysis of Network Traffic

Speaker: Ljiljana Trajkovic, Simon Fraser University, Canada

Abstract: Collection and analysis of data from deployed networks is essential for understanding communication networks. Hence, data mining and statistical analysis of network data have been employed to determine traffic loads, analyze patterns of users' behavior, predict future network traffic, and detect traffic anomalies. The Internet has historically been prone to failures and attacks that significantly degrade its performance, affect Internet connectivity, and cause routing disconnections. Frequent cases of various cyber threats have been encountered over the years and, hence, detection of anomalous behavior is a topic of great interest in cybersecurity. In the described case studies, traffic traces collected by various collection sites are used to classify network anomalies. Various anomaly and intrusion detection approaches based on machine learning have been employed to analyze collected data. Deep learning, broad learning, gradient boosted decision trees, and reservoir computing algorithms were used to develop models based on collected datasets that contain Internet worms, viruses, power outages, ransomware events, router misconfigurations, Internet Protocol hijacks, and infrastructure failures in times of conflict. The reported results indicate that while performance of machine learning models greatly depends on the datasets used, they are viable tools for detecting Internet anomalies.

Ljiljana Trajkovic received the Dipl. Ing. degree from the University of Pristina, Yugoslavia, the M.Sc. degrees in electrical engineering and computer engineering from Syracuse University, Syracuse, NY, and the Ph.D. degree in electrical engineering from the University of California, Los Angeles. She is currently a professor in the School of Engineering Science, Simon Fraser University, Burnaby, British Columbia, Canada. Her research interests include communication networks and dynamical systems. Dr. Trajkovic served as IEEE Division X Delegate/Director, President of the IEEE Systems, Man, and Cybernetics Society, and President of the IEEE Circuits and Systems Society. She serves as Editor-in-Chief of the IEEE Transactions on Human-Machine Systems. She is a Distinguished Lecturer of the IEEE Systems, Man, and Cybernetics Society and was a Distinguished Lecturer of the IEEE Circuits and Systems Society. She is a Fellow of the IEEE.



Title: Theories and Applications of Distributed Optimization in Networks

Speaker: Wenwu Yu (虞文武), Southeast University, China

Abstract: Distributed optimization is solved by the mutual collaboration among a group of agents, which arises in various domains such as machine learning, resource allocation, location in sensor networks and so on. In this talk, we introduce two kinds of distributed optimization problems: (i) the agents share a common decision variable and local constraints; (ii) the agents have their individual decision variables but that are coupled by global constraints.

This talk comprehensively introduces the origin of distributed optimization, classical works as well as recent advances. In addition, based on reinforcement learning, shortest path planning, and mixed integer programming, we build the distributed optimization framework of distributed optimization, and also discuss their applications. Finally, we make a summary with future works for distributed optimization.

Wenwu Yu received the B.Sc. degree in information and computing science and M.Sc. degree in applied mathematics from the Department of Mathematics, Southeast University, Nanjing, China, in 2004 and 2007, respectively, and the Ph.D. degree from the Department of Electronic Engineering, City University of Hong Kong, Hong Kong, China, in 2010. Currently, he is the Dean in the School of Mathematics. He is also a Full Professor with the Endowed Chair Honor in Southeast University, China.

Professor Yu is also the Executive Deputy Director of the Jiangsu Provincial Key Laboratory of Networked Collective Intelligence, the Vice Director of the Key Laboratory of Measurement and Control of Complex Systems of Engineering, Ministry of Education of China, the Head of the Information Mathematics Discipline in the Research Center for Mathematical and Physical Fundamentals, Purple Mountain Laboratories, the Executive Director of the Jiangsu National Center of Applied Mathematics in Southeast University, and the Huawei-Southeast University Networked Collective Intelligence Joint Innovation Lab.

Dr. Yu held several visiting positions in Australia, China, Germany, Italy, the Netherlands, and the USA. His research interests include multi-agent systems, complex networks and systems, disturbance control, distributed optimization, machine learning, game theory, cyberspace security, smart grids, intelligent transportation systems, big-data analysis, etc.

Dr. Yu serves as an Editorial Board Member of several flagship journals, including IEEE Transactions on Circuits and Systems II, IEEE Trans. Industrial Cyber-Physical Systems, IEEE Transactions on Fuzzy Systems, IEEE Transactions on Industrial Informatics, IEEE Transactions on Systems, Man, and Cybernetics: Systems, Science China Information Sciences, Science China Technological Sciences, etc. He is also the Editor-in-Chief of Complex Engineering Systems.

He was listed by Clarivate Analytics/Thomson Reuters Highly Cited Researchers in Engineering in 2014-2024. He publishes about 100 IEEE Transactions journal papers with more than 30,000 citations. Moreover, Dr. Yu is also the recipient of the Second Prize of State Natural Science Award of China in 2016. He was also selected for the Cheung Kong Scholars Programme of the Ministry of Education of China (Artificial Intelligence).



Title: Numerical investigation of effective stability and chaos in the J2–Solar radiation pressure problem

Speaker: Haris Skokos, University of Cape Town, South Africa; Max Planck Institute for the Physics of Complex Systems, Germany

Abstract: The rapid increase in satellite activity in recent years has transformed the Low Earth Orbit (LEO) region into a congested and collision-prone environment. In this talk, we investigate the regular and chaotic dynamics of satellites under the combined effects of Earth's oblateness (J2) and solar radiation pressure (SRP), with particular emphasis on natural reentry pathways. Using the Smaller Alignment Index (SALI) method to distinguish between regular and chaotic orbits, we explore how the phase space structure and reentry dynamics depend on the satellite's area-to-mass ratio. We find that, for sufficiently large area-to-mass ratios, reentry lifetimes follow a power law distribution. Remarkably, despite the presence of chaotic regions in phase space, trajectories satisfying the 25-year reentry criterion remain predominantly regular until atmospheric decay. These results provide insight into the dynamical mechanisms underlying natural de-orbiting and their potential relevance to passive space debris mitigation.

Haris Skokos obtained a BSc in Physics (1990), a BSc in Mathematics (2005), and a PhD in Nonlinear Dynamics (1997) from the University of Athens, Greece. Over the years, he has worked at several institutions, including the University of Athens, the Academy of Athens, the University of Patras, the Aristotle University of Thessaloniki (Greece), the Observatory of Paris (France), and the Max Planck Institute for the Physics of Complex Systems in Dresden (Germany). He is currently a Full Professor at the University of Cape Town (UCT), South Africa, where he leads the 'Nonlinear Dynamics and Chaos' research group.

His research focuses on nonlinear dynamical systems and chaotic dynamics, combining theoretical developments with applications across disciplines. His work involves the design of mathematical tools for the analysis of chaotic systems and their application to problems in statistical and solid-state physics, astronomy, biology, accelerator dynamics, and mathematical model systems. He is the originator of a novel class of chaos detection techniques (the SALI and GALI methods), has developed efficient numerical integration methods, and has made influential contributions to the study of chaotic dynamics in disordered nonlinear lattices.

Prof. Skokos has authored 90 papers in international peer-reviewed journals, 46 papers in conference proceedings, 3 book chapters, and co-authored a book titled 'Complex Hamiltonian Dynamics' (Springer). His h-index is 27 in Web of Science, 28 in Scopus, and 37 in Google Scholar. He has co-edited 2 special issues of the 'International Journal of Bifurcation and Chaos', 1 focus issue of 'Chaos', and a 'Lecture Notes in Physics' volume on 'Methods of Chaos Detection and Predictability'. He has organized several international conferences and serves on the editorial boards of international journals and on research review panels worldwide. From 2022 to 2024, he served as Deputy Dean for Postgraduate Studies and Research, in the Science Faculty of UCT. He is a member of the UCT College of Fellows and the Academy of Science of South Africa (ASSAf), a Fellow of the Royal Society of South Africa, and a Senior Associate of the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy.



Title: Inherently Unstable Negative Reactive Device for Power Applications

Speaker: C. K. Michael Tse (谢智刚) , City University of Hong Kong, Hong Kong

Abstract: Negative inductance does not exist in the real world. Such absence limits the development of many electrical systems and the removal of undesired inductance, which has long been addressed by complicated resonance-based compensation methods. In this talk, we present a practical realization of negative inductance for power processing applications that will open up an entirely new direction for electrical systems design and can lead to significant improvement in power efficiency. We show how to obtain a standalone negative inductance that can directly cancel an existing positive inductance or any portion of it. This breakthrough contributes to the advancement of negative reactance technologies beyond the small-signal limitations of conventional analog impedance converters. The negative inductance device introduced here offers convenient manipulation of inductive properties that can significantly enhance efficiency and power capacity, opening new avenues for sustainable energy applications.

C. K. Michael Tse graduated from the University of Melbourne, Australia, with BEng(Hons) and PhD in electrical engineering. He is Associate Vice-President for Innovation, Director of the Academy of Innovation and Chair Professor of Electrical Engineering at City University of Hong Kong. He is/was honorary professor and distinguished fellow with several Australian, Canadian and Chinese universities, including the University of Melbourne, RMIT University, University of Western Australia and the University of Calgary, and as Chang Jiang Scholar Chair Professor with Huazhong University of Science and Technology.

His research interests are primarily in power electronics and nonlinear systems. He was awarded numerous research and invention prizes, including the IEEE CASS Charles A. Desoer Technical Achievement Award in 2022. He was Editor-in-Chief of an IEEE Transactions and IEEE Magazine, and on the editorial board of Proceedings of the IEEE. He was elected IEEE Fellow in 2005, Fellow of IEAust and HKIE, and inducted to the Hong Kong Academy of Engineering in 2025.

In April 2025, he staged a duo exhibition "Blooming Calligraphy" at Salon International d'Art Contemporain, Louvre, Paris. In 2026, he co-curated "Prototyping", an exhibition bridging technologies and society, at the Indra and Harry Banga Gallery.

By invitation of World Scientific Publishing (Singapore), he took up the role of Founding Editor-in-Chief of the Journal of Digital Energy Conversion, a new journal to be launched in 2027 focusing on emerging research in all aspects of power electronics and systems.



Title: Reservoir Computing and Ordinal Encodings

Speaker: Michael Small, The University of Western Australia, Australia

Abstract: Reservoir computers provide a useful paradigm for studying both dynamical systems and recurrent neural networks.1,2 They are random recurrent dynamical networks driven by an input time series, in which only the output layer is trained — typically via linear regression and regularization. This makes them lightweight and general-purpose, yet remarkably powerful for modelling nonlinear dynamical systems. I will explain why this is the case, showing that the internal state of the reservoir captures the same features as a time-delay embedding — that is, it reconstructs the underlying high-dimensional dynamics from a scalar observable. Using what we call Reservoir Time Series Analysis,3 I will show that this internal state encodes enough information to rival state-of-the-art tools in nonlinear time-series analysis, including recurrence quantification methods. Finally, I will introduce new work constructing a reservoir substrate from the ordinal encoding4 of a time series, demonstrating that even this simple representation suffices for reservoir-based information processing — opening the door to new applications of reservoir computing.

Professor Michael Small holds the CSIRO–UWA Chair in Complex Systems and is Director of the UWA Data Institute at the University of Western Australia, where he is also Professor of Applied Mathematics. His research addresses nonlinear dynamics, complex networks, and data-driven modelling, with applications spanning predictive maintenance, cardiac arrhythmia, epidemic and mental-health modelling, financial engineering, and geological discovery. He is Editor-in-Chief of the journal Chaos and Main Editor of Physica A, and has served as Chief Investigator on three Australian Research Council Industrial Transformation Research Program Centres and a new Centre of Excellence for post-Quantum Computation, attracting more than AUD 75 million in competitive research funding. His honours include a Fellowship of the Australian Mathematical Society, an ARC Professorial Future Fellowship, and the 2022 Afraimovich Award for Contributions to Nonlinear Science and Complexity, awarded by the Nonlinear Science Society.



Title: Complex Intelligence: Higher-order Interactions of Cavity, Brains, and More

Speaker: Xiang Li (李翔) , Fudan University, China

Abstract: The past decades have witnessed enormous efforts to explore the network complexity rooted in all of science, from neurobiology to statistical physics. After briefly reviewing complex network science, from the seminal work on small-world/scale-free models to human dynamics and social intelligence, this talk moves on to higher-order networks interacting with intelligent systems. I will report several examples of our recent findings covering the diffusion graph transformer, brain mapping with functional behaviors, collective oscillator dynamics, and more, as footnotes to complex intelligence.

Professor Xiang Li is a distinguished professor and academic development director of the Research Institute of Intelligent Complex Systems, Fudan University. His research interests cover complex network science and system engineering, brain-like complex intelligent system theory and applications. Prof. Li is the chief scientist of the National Science and Technology Major Project (2025), and received the National Science Foundation for Distinguished Young Scholar of China in 2014, the National Ten-Thousand Project in 2017. He serves as chair or co-chair of several technical committees on complex network and systems science at CSIAM, CICC, and other organizations. He is an Editor-at-Large of IEEE Transactions on Network Science and Engineering and an Associate Editor of Research and Journal of Complex Networks, among other journals. Prof. Li received the IEEE Guillemin-Cauer Award from IEEE Circuits and Systems Society in 2005, Shanghai Natural Science Award (1st class) in 2008, Shanghai Science and Technology Young Talents Award in 2010, National Natural Science Award of China (2nd class) in 2015, TCCT CHEN Han-Fu Award of the Chinese Association of Automation in 2019, among many awards and honors.



Title: Robust Cooperative Control of Constrained Networked Systems

Speaker: Shanling Dong (董山玲), Zhejiang University, China

Abstract: Networked control technology is widely applied in multi-robot systems, power systems, aerospace systems, and so on. This report focuses on issues commonly existing in network environments, such as sudden changes in system structures or parameters, limited network resources, and external noise interference, and introduces recent research work on robust cooperative control of constrained networked systems.

Shanling Dong received the B. E. degree in Automation from Xidian University, Xi'an, China, in 2014, and the Ph.D. degree in Control Science and Engineering from Zhejiang University, Hangzhou, China, in 2019. Supported by the China Scholarship Council, she was a Visiting Graduate Student at the University of California, Riverside, USA, from Sep. 2017 to Sep. 2018. She was a Research Associate and Post-Doctoral Research Fellow with City University of Hong Kong, Hong Kong SAR, China, from Dec. 2019 to Dec. 2020. She is currently with the College of Electrical Engineering, Zhejiang University, Hangzhou, Zhejiang, China. Her research interests include Markov jump systems, marine robot control and multi-agent systems.



Title: Distributed Estimation of Complex Large-Scale Interconnected Systems

Speaker: Bo Chen (陈博), Zhejiang University of Technology, China

Abstract: Centralized estimation ensures stable performance for individual systems but suffers from heavy computation and poor scalability, limiting its application in large-scale interconnected systems (LIS). Distributed estimation has therefore attracted extensive attention for networked system estimation. This presentation addresses three key challenges in LIS distributed estimation. Can the coupled distributed Riccati difference equations, formed due to dynamic couplings among subsystems, maintain the stability of state estimation for the entire LIS? How can we fuse the redundant information brought by overlapping states among subsystems to improve estimation accuracy? How can we construct purely data-driven distributed estimation methods when precise identification of the large-scale interconnected system is intractable?

Bo Chen, is a recipient of the National "Four Young Talents" Program, Fellow of the Royal Aeronautical Society(RAeS), Professor and Doctoral Supervisor. He serves as the Vice Dean of the College of Information Engineering, Zhejiang University of Technology.

He has been engaged in research on networked information fusion estimation and cyber-physical systems security for a long time, establishing a theoretical framework for multi-sensor distributed fusion estimation and security fusion estimation under information transmission uncertainties. As the first or corresponding author, he has published more than 50 papers in top international journals including Automatica and IEEE Transactions, such as IEEE-TICPS, IEEE-TAC, IEEE-TAES, IEEE-TIM, and IEEE-TC, including 23 papers in IEEE-TAC and Automatica (5 full-length papers). He has authored 2 English monographs and holds 29 authorized national invention patents. His works have attracted extensive attention from peers, accumulating over 5200 citations in Google Scholar with an H-index of 39, and the highest single-paper non-self citation reaches 360. He has been listed in the World's Top 2% Scientists for 2023–2026. He has presided over more than 20 research projects including the Joint Key Program of the National Natural Science Foundation of China, the Continuation Program for Outstanding Youth of Zhejiang Natural Science Foundation. His research achievements have won multiple awards, including the First Prize of the Natural Science Award of the Ministry of Education, the First Prize of Zhejiang Natural Science Award, the Excellent Doctoral Dissertation Award of CAA.

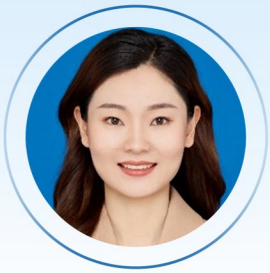


Title: Boundary Coverage Control for Multi-Agent Systems without Connectivity Preservation

Speaker: Cheng Song (宋程) , Nanjing University of Science and Technology, China

Abstract: Multi-agent coverage control involves designing distributed controllers that enable a group of mobile agents to autonomously move from their initial positions to optimal deployment locations, thereby achieving optimal sensing or monitoring of a target area. Due to the limited communication range of the agents, maintaining network connectivity requires keeping the inter-agent distances within a certain range. However, coverage tasks typically necessitate the dispersion of agents across the entire mission area. When the communication range is insufficient, simultaneously achieving both coverage and connectivity preservation is often challenging. Therefore, this report investigates the problem of multi-agent boundary coverage control without the requirement of connectivity preservation. It presents the design of a distributed switching coverage controller for mobile agents and provides an analysis of the system's convergence, as well as the lower bound on the communication radius required to achieve optimal coverage.

Cheng Song received the B.Eng. degree in automation from the University of Science and Technology of China, Hefei, China, in 2007, and the Ph.D. degree in control science and engineering from the University of Science and Technology of China and the City University of Hong Kong, Hong Kong, in 2012. He is currently a Professor with the School of Automation, Nanjing University of Science and Technology, Nanjing, China. His research interests include multi-agent systems, cooperative control, and optimal control. He was selected as the Young Top-notch Talent of the National Ten Thousand Talents Program and received several scientific and technological awards, including the Second Prize for Natural Science from the Chinese Association of Automation.



Title: From Lightweight Memristive Neural Networks to Multimodal Brain-Inspired Computing: Models, Architectures, and Systems

Speaker: Xiaofang Hu (胡小方) , Southwest University, China

Abstract: Memristor-based computing provides a promising solution for energy-efficient edge AI, yet practical applications face challenges such as device variability, peripheral-circuit overhead, and hardware mapping complexity. This talk presents recent advances in memristive computing from lightweight neural networks to multimodal brain-inspired systems. At the model level, it explores reliability-aware learning and mixed-precision neural networks for robust and efficient inference. At the architecture level, it introduces reconfigurable memristive circuits and lightweight Transformer implementations for hardware acceleration. At the system level, it discusses multimodal in-memory computing frameworks integrating Transformer-based feature fusion with memristive hardware for visual, acoustic, and textual processing. Finally, the talk highlights key challenges and future directions in device reliability, hardware-software co-design, scalable circuit architectures, and heterogeneous neuromorphic computing, offering insights into the development of efficient and intelligent edge AI systems.

Xiaofang Hu is a Professor, Ph.D. Supervisor, and Vice Dean of the School of Artificial Intelligence at Southwest University, China. Dr. Hu received a Ph.D. from City University of Hong Kong in 2015, and previously served as a visiting scholar at the University of Pittsburgh and a postdoctoral researcher at City University of Hong Kong. Research interests include memristor-based neural networks, neuromorphic computing, artificial intelligence algorithms, novel computing architectures, and efficient hardware acceleration. Dr. Hu has published more than 60 academic papers, including work recognized as an IEEE TNNLS Popular Paper and a highly cited paper in SCIENCE CHINA Information Sciences. Research on brain-inspired computing was featured in the Chinese Academy of Engineering's Engineering Fronts 2020. Dr. Hu has led projects funded by the National Natural Science Foundation of China and other research programs. Honors include the Third Prize of the Chongqing Natural Science Award (2017) and Chongqing Young Science and Technology Pioneer (2022). Dr. Hu serves as an Associate Editor of the International Journal of Bifurcation and Chaos.



Title: Secure and Safe Optimization and Control of Cyber-Physical Systems

Speaker: Xiaoqiang Ren（任肖强）, Shanghai University, China

Abstract: Focusing on complex networked systems that deeply integrate sensing, communication, computation, control, and the physical world, this talk addresses their security risks and presents our group's recent research advances. These include performance-guaranteed multi-source information fusion methods under data tampering attacks, privacy-preserving distributed optimization algorithms, and safe controller designs with performance guarantees.

Xiaoqiang Ren is a Professor at Shanghai University. In 2019, he was selected for the Youth Program of the National Overseas High-Level Talent Recruitment Program, and in 2024, he was selected for the Shanghai Shuguang Scholar Program. He serves as the Vice Dean of the School of Future Technology at Shanghai University and the Director of the Office of the National Key Laboratory of Maritime Unmanned Swarm Intelligence.

Focusing on research areas such as the secure and intelligent control of complex networked systems, he has published over 60 papers in leading international journals. Among these, he was the first or corresponding author of over 20 papers published in flagship journals in control and signal processing, including IEEE Transactions on Automatic Control, Automatica, and IEEE Transactions on Signal Processing.

He serves as the Principal Investigator for Key and General Programs of the National Natural Science Foundation of China (NSFC), as well as projects under the National Key R&D Program of China. He also serves as a Co-PI of an NSFC Innovative Research Group. As the lead researcher, he was awarded the Second Prize of the Shanghai Natural Science Award.

He is a member of the IEEE Control Systems Society Conference Editorial Board (CSS CEB) and served on the organizing committees for the Chinese Control Conference (CCC 2021) and the International School and Conference on Network Science (NetSci 2022). Additionally, he is a Council Member of the Shanghai Association of Automation, a Committee Member of the Cyber-Physical Systems Control and Decision Professional Committee of the Chinese Association of Automation (CAA), and a Committee Member of the Embodied Intelligence Professional Committee of the Chinese Institute of Command and Control (CICC).



Title: Model-based and Data-driven Control of Periodic Systems: Multi-affine and Switching-inspired Approaches

Speaker: Xiaochen Xie (谢晓晨) , Harbin Institute of Technology, Shenzhen, China

Abstract: Many practical systems exhibit periodically varying parameters or structures, which can be effectively modeled as dynamic systems with periodic time-varying or periodic piecewise characteristics. However, controller synthesis for such systems can be challenging because continuously varying coefficients lead to nonconvex conditions, and accurate system models are not always available in practice. This talk introduces our recent research progress on model-based and data-driven control approaches for periodic systems. From a model-based perspective, Fourier-series representations and multi-affine techniques are developed to convert time-varying conditions of stability and performance to convex forms, with application to reachable set estimation and extended dissipativity synthesis under control-input constraints. From a data-driven perspective, the nominal system is modeled as a periodic piecewise linear system inspired by switching. It provides stabilizing controller synthesis directly from measured data, even when some subsystems remain unstable.

Xiaochen Xie is a professor and doctoral supervisor of the School of Intelligence Science and Engineering at Harbin Institute of Technology, Shenzhen, China. She received the Ph.D. degree in control engineering from The University of Hong Kong in 2018. She is a recipient of the NSFC Excellent Young Scientists Fund Program (Overseas), an Honorary Professor in the Department of Mechanical Engineering at The University of Hong Kong, and an Alexander von Humboldt Research Fellow. Her research interests include the control and monitoring of periodic systems, almost periodic systems, switched systems, cyber-physical systems, and intelligent robotic systems. Over the past five years, she has led three NSFC projects, the Shenzhen High-level Talent Project, the Shenzhen Natural Science Fund General Project, and two research projects at The University of Hong Kong as Co-PI. She has published over 50 papers in influential automation and control journals, and holds 5 authorized national invention patents. She serves as an Associate Editor for the Journal of the Franklin Institute and IET Control Theory & Applications. She is an IEEE Senior Member and has served on the Intelligent Control and Systems Committee and the Embodied Intelligence Committee of the Chinese Institute of Command and Control (CICC), as well as the Fully Actuated System Theory and Applications Technical Committee of the Asian Control Association (ACA).



Title: Predicting Dynamics of Ultra-Large Complex Systems by Inferring Governing Equations

Speaker: Duxin Chen (陈都鑫), Southeast University, China

Abstract: Predicting the behavior of ultra-large complex systems, from climate to biological and technological networks, is a central unsolved challenge. Here, we introduce the Sparse Identification Graph Neural Network, a framework that overcomes this divide by allowing to infer

The governing equations of large networked systems with shared intrinsic and coupling dynamics from data. By defining symbolic discovery as edge-level information, SIGN decouples the scalability of sparse identification from network size, enabling efficient equation discovery even in large systems. SIGN allows to study networks with over 100,000 nodes while remaining robust to noise, sparse sampling, and missing data. By enabling equation discovery at previously inaccessible scales, SIGN opens a path toward interpretable and scalable prediction of real-world complex systems.

Duxin Chen is a professor at the department of systems science, Southeast University. His research interests include AI for Complex Systems, AI4S, as well as fundamental theories and applications of artificial intelligence. He has published over 50 papers in journals and conferences, such as Nature Communications, ICLR, NeurIPS, KDD, and IEEE Transactions. He has led over 20 projects or research tasks, including those funded by the National Natural Science Foundation of China, and the Ministry of Science and Technology's Key Research and Development Program. He has received accolades including the Huawei Spark Award, JSIAM Young Science and Technology Award, and Best Paper Awards at international conferences.



Title: Cascading Failure Modeling and Resilience Analysis in Complex Power Networks

Speaker: LIU Dong (刘东) , Hong Kong Metropolitan University, Hong Kong

Abstract: Large-scale power blackouts are relatively rare, yet their consequences can be far-reaching. As power networks evolve with increasing penetration of inverter-based resources, changing electricity demand patterns, and growing exposure to extreme events, understanding and mitigating cascading failures has become increasingly challenging. This talk presents recent advances in cascading failure modeling and resilience analysis from a complex network perspective. First, we introduce network-based cascading failure models that incorporate frequency control dynamics and the failure mechanisms of inverter-based resources, revealing their impacts on failure propagation and large-scale blackout risks. Building upon these modeling insights, we then explore intelligent data-analytic approaches that integrate network science and machine learning to enable efficient identification of critical power grid components. These approaches support proactive infrastructure reinforcement before cascading failures and timely identification of vulnerable components as failures propagate. Finally, we discuss emerging challenges for future power grid resilience arising from two distinct directions: external disruptions driven by extreme weather events and internal transformations associated with the rapidly growing and dynamic electricity demand of AI data centers. Together, these studies highlight the potential of combining complex network modeling and intelligent analysis to better understand cascading failures, assess blackout risks, and enhance the resilience of evolving power networks.

Dr LIU Dong is a Lecturer in the School of Science and Technology at Hong Kong Metropolitan University. He received both his BEng (with First Class Honours) and PhD from The Hong Kong Polytechnic University, where his doctoral research focused on the robustness of cyber-coupled power systems. Before joining HKMU, he held research and postdoctoral positions at The Hong Kong Polytechnic University and subsequently became a research and postdoctoral fellow at the Centre for Complexity and Complex Networks, City University of Hong Kong.

His research centres on the modeling, reliability, and resilience of power grids and cyber-physical systems, with particular emphasis on cascading failures, complex networks, smart grids, and AI-enabled infrastructure resilience. He has published more than 39 refereed journal articles and conference papers and is the lead author of the 2026 CRC Press monograph Robustness of Evolving Power Grids: Modeling and Analysis. As Principal Investigator, he has secured competitive and institutional research funding, including a Hong Kong Research Grants Council Faculty Development Scheme grant on climate-resilient power grids and an HKMU Research and Development Fund project on AI data-centre load dynamics. He also serves as a Full Member of the Power and Energy Circuits and Systems Technical Committee (PECAS) of the IEEE Circuits and Systems Society.

IV. Transportation and Weather Information

（I） Transportation Information

1. Hangzhou Xiaoshan International Airport → Baimahu Jianguo Hotel (No. 336 South Changjiang Road, Binjiang District, Hangzhou, Zhejiang Province): approx. 32 km by taxi, about 36 minutes.

2. Hangzhou East Railway Station → Baimahu Jianguo Hotel (No. 336 South Changjiang Road, Binjiang District, Hangzhou, Zhejiang Province): approx. 21 km by taxi, about 27 minutes.

（II）Weather Information

October 30: Sunny to cloudy, high 26°C, low 18°C.

October 31: Cloudy with light rain, high 25°C, low 16°C.

November 1: Heavy rain turning to light rain, high 20°C, low 18°C.

四、交通与天气信息

（一）交通信息

1.杭州萧山国际机场-杭州白马湖建国饭店（浙江省杭州市滨江区长江南路336号），打车路程约32公里，时长约36分钟。

2.杭州东站-杭州白马湖建国饭店（浙江省杭州市滨江区长江南路336号），打车路程约21公里，时长约27分钟。

（二）天气信息

10月30日：晴转多云，最高气温26°C， 最低气温18°C。

10月31日：多云转小雨，最高气温25°C， 最低气温16°C。

11月1日：大雨转小雨，最高气温20°C， 最低气温18°C。

Sponsor: Centre for Complexity and Complex Networks at City University of Hong Kong

Organizer: Hangzhou Innovation Institute of Beihang University

主办单位：香港城市大学复杂性与复杂网络研究中心

承办单位：北京航空航天大学杭州创新研究院