

Special Session XI

Special Session Basic Information:

专栏题目 Session Title	中文：人工智能驱动的综合能源系统：大模型、云边协同与运行优化 英文：Ai-driven Integrated Energy Systems: Large Language Models, Cloud-edge Collaboration, and Operational Optimization
专栏介绍和征稿主题 Introduction and topics	
中文： 在“双碳”目标与新型电力系统建设背景下，综合能源系统通过电、热、气、氢等多能互补和源网荷储协同，成为提升可再生能源消纳能力与能源利用效率的重要载体。然而，多能流耦合、源荷强不确定性、设备异构以及海量分布式资源接入，使其建模、调度与运行优化面临维度高、实时性差、知识利用不足等挑战。以大模型为代表的人工智能技术为复杂能源系统提供了新的知识推理与决策范式，云边协同则为低时延、分布式、隐私保护的智能计算提供了架构支撑。本分论坛聚焦“人工智能驱动的综合能源系统”，围绕大模型、云边协同与运行优化，探讨前沿理论、关键算法、平台系统与典型应用，推动人工智能与能源领域的深度交叉融合。征稿方向包括但不限于： 1.综合能源系统多能流耦合建模与人工智能代理模型 2.面向能源系统的大语言模型与多模态大模型 3.大模型辅助的综合能源系统调度决策与知识推理 4.云边协同架构、边缘智能与算力资源调度 5.云边端协同的分布式优化、联邦学习与隐私计算 6.源网荷储氢协同运行优化与系统灵活性提升 7.不确定性环境下综合能源系统鲁棒优化 8.综合能源系统数字孪生、智能运维与故障诊断 9.虚拟电厂、综合能源服务与人工智能市场决策 10.综合能源系统韧性安全、低碳运行与零碳园区应用 11.碳交易绿电绿证与综合能源系统协同优化 欢迎相关领域专家学者、青年教师、研究生及业界人士踊跃投稿。 英文： Under the background of the " double carbon " target and the construction of new power system, the integrated energy system has become an important carrier to improve the renewable energy consumption capacity and energy utilization efficiency through the multi-energy complementarity of electricity, heat, gas and hydrogen and the coordination of source, grid, load and storage. However, multi-energy flow coupling, source-load uncertainty, device heterogeneity, and massive distributed resource access make its modeling, scheduling, and operation optimization face challenges such as high dimensions, poor real-time performance, and insufficient knowledge utilization. Artificial intelligence technology represented by large models provides a new knowledge reasoning and decision-making paradigm for complex energy systems. Cloud-side collaboration provides architecture support for low-latency, distributed, and privacy-preserving intelligent computing. This sub-forum focuses on ' artificial intelligence-driven integrated energy system ', and discusses cutting-edge theories, key algorithms, platform systems and typical applications around large models, cloud-edge collaboration and operation optimization, so as to promote the deep cross-integration of artificial intelligence and energy fields. The direction of solicitation includes but is not limited to : 1.Multi-energy flow coupling modeling and artificial intelligence agent model of integrated energy system 2.Large language model and multi-modal large model for energy system 3.Large model-assisted scheduling decision and knowledge reasoning for integrated energy system 4.Cloud-edge collaborative architecture, edge intelligence and computing power resource scheduling	

- 5.Distributed optimization, federated learning and privacy computing for cloud-side collaboration
- 6.Source-grid-load hydrogen storage collaborative operation optimization and system flexibility improvement
- 7.Robust optimization of integrated energy system under uncertain environment
- 8.Digital twin, intelligent operation and maintenance and fault diagnosis of integrated energy system
- 9.Virtual power plants, integrated energy services and artificial intelligence market decision-making
10. Resilient, safe and low-carbon operation of integrated energy systems and application of zero-carbon parks
11. Collaborative optimization of carbon trading green certificate and integrated energy system
- Welcome experts and scholars in related fields, young teachers, graduate students and industry professionals to contribute.

Special Session Chair(s):

	姓名	孙鹏
	Name	Peng Sun
	称谓	讲师
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	部门	电气工程学院
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Organizer's Brief Biography

中文：
孙鹏，博士，东北电力大学校聘副教授、硕士生导师、在站博士后，吉林省高层次人才。担任《综合智慧能源》、《山东电力技术》等期刊青年编委。主持吉林省自然科学基金项目1项、吉林省博士后在站择优资助项目1项。以第一/通信作者身份在《中国电机工程学报》、《Applied Energy》等期刊发表SCI/EI论文20余篇。获评2019—2020年度《中国电机工程学报》高影响力论文，2024中国知网高被引学者TOP1%。

英文：
Sun Peng, Dr., an university-appointed associate professor of Northeast Electric Power University, master 's tutors, on-site post-doctoral, high-level talents in Jilin Province. He served as a young editorial board member of journals such as ' Integrated Smart Energy ' and ' Shandong Electric Power Technology '. He presided over 1 project of Jilin Provincial Natural Science Foundation and 1 project of postdoctoral station selection in Jilin Province. He has published more than 20 SCI / EI papers in journals such as 'Proceedings of the CSEE ' and ' Applied Energy ' as the first / corresponding author. It has been evaluated as a high-impact paper of China Journal of Electrical Engineering from 2019 to 2020, and TOP 1 % of highly cited scholars in 2024 China National Knowledge Infrastructure.

	姓名	金红洋
	Name	Hongyang Jin
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Organizer's Brief Biography

中文：

金红洋，博士，讲师，中国电工技术学会高级会员，日本电气学会会员，全国三维数字化创新设计大赛东北赛区技术专家委员会专家委员。主持并参与国家重点研发计划项目、辽宁省科技厅项目、辽宁省教育厅项目和大型央企科技攻关项目二十余项，深度参与集装箱储能系统制造标准的制定，以第一/通讯作者身份发表 SCI/EI 论文十余篇，授权发明专利十余项。

英文：

Hongyang Jin, Doctor, Lecturer, Senior Member of China Electrical Technology Society, Member of Japan Electrical Society, Member of Technical Expert Committee of Northeast Division of National 3D Digital Innovation Design Competition. He has presided over and participated in more than 20 national key R & D projects, Liaoning Provincial Science and Technology Department projects, Liaoning Provincial Education Department projects and large-scale central state-owned enterprise science and technology research projects. He has been deeply involved in the formulation of manufacturing standards for container energy storage systems. He has published more than 10 SCI / EI papers as the first / correspondent author, and authorized more than 10 invention patents.



姓名 Name	左浩 Hao Zuo
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Organizer's Brief Biography

中文：

左浩，博士，山东航空学院讲师、硕士生导师。从事综合能源系统调度与规划、综合能源系统优化控制等方面的研究。承担/参与国家重点研发/省部级科技项目/国家电网公司科技项目 10 余项。以第一/通信作者身份在《中国电机工程学报》、《Electric Power Systems Research》等高水平期刊发表 SCI/EI 论文 10 余篇，获授权发明专利 20 余项。

英文：

Zuo Hao, Ph.D., Lecturer and Master Supervisor of Shandong Aeronautical University. Engaged in integrated energy system scheduling and planning, integrated energy system optimization control and other aspects of research. Undertake / participate in more than 10 national key R & D / provincial and ministerial science and technology projects / national grid company science and technology projects. As the first / corresponding author, he has published more than 10 SCI / EI papers in high-level journals such as 'Proceedings of the CSEE' and 'Electric Power Systems Research', and has been authorized more than 20 invention patents.



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Organizer's Brief Biography

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刘硕，博士，国网宁夏电力有限公司电力科学研究院专责，从事电力系统运行与调度，综合能源系统运行优化等方面研究。参与国家科技重大专项/国家电网公司科技项目 10 余项，以第一/通信作者身份在《中国电机工程学报》、《Electric Power Systems Research》等高水平期刊发表 SCI/EI 论文 10 余篇，获授权发明专利 10 余项。

英文：

Shuo Liu, Ph.D., a specialist of State Grid Ningxia Electric Power Co., Ltd. Electric Power Science Research Institute. He is engaged in research on power system operation and dispatch, operation optimization of integrated energy systems and other aspects of research. He has participated in more than 10 national science and technology major projects / science and technology projects of the State Grid Corporation of China. As the first / corresponding author, he has published more than 10 SCI / EI papers and authorized more than 10 invention patents in high-level journals such as ' Proceedings of the CSEE ' and ' Electric Power Systems Research ', and has been authorized more than 10 invention patents.