Special Session Proposal

Special Session Basic Information:

专栏题目 **Session Title**	中文：面向高效接纳高比例分布式资源的新型配电系统智能决策与优化 英 文 ： Intelligent Decision-making and Optimization of New Distribution System for Efficiently Accepting High Proportion of Distributed Resources

专栏介绍和征稿主题
Introduction and topics

中文：随着能源转型的加速推进，高比例分布式资源接入配电系统成为必然趋势。然而，分布式资源的分散性、异构性、随机性等特点，导致运行复杂度增加、运行安全风险加剧等问题，给系统决策与优化带来严峻挑战。此外，高比例分布式资源的协同运行能力不足，影响系统的整体运行效率，加剧了配电系统管理的复杂性。在此背景下，智能决策与优化技术为高效接纳高比例分布式资源提供了有效途径。通过大数据分析、机器学习、深度学习、强化学习等先进技术和算法，新型配电系统能够实现对分布式资源的精准预测、实时监测、智能调度和优化控制。智能算法能够充分利用大量历史数据和实时运行信息，显著提升系统对分布式资源的接纳能力，降低预测误差，快速定位故障，同时动态调整运行策略，实现系统的经济运行和稳定控制。鉴于上述挑战与需求，本专题旨在搭建一个学术交流平台，广泛征集创新研究成果，深入探讨智能决策与优化技术在高效接纳高比例分布式资源的新型配电系统中的应用，报告该领域的最新进展与发展趋势。

征稿主题包括但不限于：

1.多智能体系统在分布式资源协调控制中的应用；2.深度学习在配电网故障诊断中的应用；

3.面向高比例分布式资源接入的配电网规划与设计；4.智能决策支持系统在新型配电系统中的应用；

5.分布式资源聚合与虚拟电厂的智能运行管理；6.基于智能算法的配电网潮流优化与电压控制；

7.面向高效接纳分布式资源的配电网灵活性提升技术

英 文 ： With the acceleration of energy transformation, the high proportion of distributed resources into the distribution system has become an inevitable trend. However, the characteristics of distributed resources such as dispersion, heterogeneity and randomness lead to problems such as increased operational complexity and increased operational security risks, which bring severe challenges to system decision-making and optimization. In addition, the lack of cooperative operation ability of high proportion of distributed resources affects the overall operation efficiency of the system and intensifies the complexity of distribution system management. In this context, intelligent decision-making and optimization technology provides an effective way to efficiently accept a high proportion of distributed resources. Through advanced technologies and algorithms such as big data analysis, machine learning, deep learning and reinforcement learning, the new distribution system can realize accurate prediction, real-time monitoring, intelligent scheduling and optimal control of distributed resources. Intelligent algorithm can make full use of a large number of historical data and real-time operation information, significantly improve the system's ability to accept distributed resources, reduce prediction errors, quickly locate faults, and dynamically adjust operation strategies to achieve economic operation and stable control of the system. In view of the above challenges and demands, this topic aims to build an academic exchange platform, extensively collect innovative research results, deeply discuss the application of intelligent decision-making and optimization technology in a new distribution system that efficiently accepts a high proportion of distributed resources, and report the latest progress and development trend in this field.

Call for papers topics include but are not limited to:

1. Application of multi-agent system in coordinated control of distributed resources; 2. Application of deep learning in fault diagnosis and self-healing control of distribution network;

3. Distribution network planning and design for high proportion of distributed resource access; 4. Application of intelligent decision support system in new distribution system;

5. Distributed resource aggregation and intelligent operation management of virtual power plant; 6. Power flow optimization and voltage control of distribution network based on intelligent algorithm;

7. Improving the flexibility of distribution network for efficiently accepting distributed resources.

Special Session Chair(s):

姓名 Name	胡旭光 Xuguang Hu
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Organizer's Brief Biography

中文：胡旭光，副教授，硕士生导师，主要研究内容为能源系统智能建模、数据分析和状态感知。主持国家自然科学基金、国家电网公司等横向项目。以第一作者/通讯作者身份在 IEEE Transactions 及卓越期刊发表论文 20 余篇，ESI 高被引论文 5 篇。获省级发明奖 3 项，发明展览金奖 2 项。相关技术改造成果支持了全国 7 个省的能源体系建设和产业发展。现任中国自动化学会能源互联网专业委员会秘书、网络能源系统与智能能源国际会议组织副主席。

英文：Xuguang Hu, Associate professor, Master supervisor, His main research content is intelligent modeling, data analytics and status awareness of energy system. He has presided over National Natural Science Foundation of China and horizontal projects of companies such as State Grid Corporation of China. As the first/corresponding authors he published over 20 papers in IEEE Transactions and excellent journals, and 5 ESI highly cited papers. Moreover, he won 3 provincial level awards and 2 international invention exhibition gold awards. The relevant technological transformation achievements have supported the construction and industrial development of energy system in 7 provinces in China. He serves as the secretary of the secretary of the Energy Internet Professional Committee of Chinese Society of Automation, and the Vice organizational committee chairman of the International Conference on Cyber-energy Systems and Intelligent Energies.

姓名 Name	黄雨佳 Yujia Huang
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Organizer's Brief Biography

中文：黄雨佳 2024 年毕业于东北大学，丹麦奥尔堡大学联合培养博士。主要进行电力系统/多能系统的建模与分析，优化与控制研究。在 IEEE Trans 汇刊、Applied Energy、中国电机工程学报、中国科学等国内外知名期刊发表论文 20 篇，受理/授权发明专利 6 项，ESI 高被引论文 1 篇。获评中国知网学术精要高 PCSI 论文、高被引论文、高下载论文，IEEE ICEI 最佳会议论文奖。

英文：Yujia Huang graduated from Northeastern University in 2024 and was visiting PhD at Aalborg University in Denmark. She mainly conducts modeling and analysis, optimization and control research of power and integrated energy system. She has published 20 papers in well-known journals at home and abroad such as IEEE Trans Transactions, Applied Energy, Proceedings of CSEE, and Science China, accepted/authorized 6 invention patents, and 1 ESI highly cited paper. Awarded by CNKI Academic Excellence high PCSI paper, high cited paper, high download paper,

IEEE ICEI Best Conference Paper Award.