Special Session Proposal

Special Session Basic Information:

专栏题目 Session Title	中文：智能电网新兴先进人工智能辅助技术 英文：Emerging Advanced AI-assisted Technologies for Smart Grids

专栏介绍和征稿主题
Introduction and topics

中文：

“智能电网新兴先进人工智能辅助技术” 特刊汇集前沿研究，探索智能电网领域中 AI 增强技术的发展。该特刊涵盖大量研究、方法和应用，凸显这些新兴技术对现代电网生态系统的重要作用。

智能电网处于技术革命前沿，受人工智能、大数据分析和通信技术发展的驱动。随着对高效、可靠、可持续能源系统需求的增长，AI 辅助技术成为关键推动力量。不过，将这些先进技术融入智能电网面临挑战，电力系统的复杂性、实时数据处理需求以及高级安全隐私要求，给电力和技术行业带来障碍。此外，基于 AI 的解决方案种类繁多，无缝互操作性需求也增加了难度。

本特刊聚焦智能电网 AI 辅助技术的最新突破，探讨 AI 算法如何优化发电和配电、增强电网稳定性、促进可再生能源整合。从电网基础设施的预测性维护到实时需求响应管理，特刊深入研究多种应用，还探索 AI 在管理分布式能源资源（如太阳能板、风力涡轮机）和应对电动汽车充电基础设施挑战方面的应用。

感兴趣的主题包括但不限于：

A. AI 驱动的电力系统优化
B. AI 支持的可再生能源整合
C. AI 赋能智能电网的网络安全
D.智能电网运营的大数据分析
E.基于 AI 的需求响应策略
F.利用 AI 的分布式能源资源管理
G. AI 增强的智能电网通信网络
H. AI 助力的电动汽车充电管理

英文：

The special issue "Emerging Advanced AI-assisted Technologies for Smart Grids" brings together cutting-edge research to explore the development of AI-enhanced technologies in the field of smart grids. This special issue covers a vast amount of research, methods, and applications, highlighting the significant role of these emerging technologies in the modern power grid ecosystem.

Smart grids are at the forefront of the technological revolution, driven by the development of artificial intelligence, big data analytics, and communication technologies. AI-assisted technologies have become a key driving force with the increasing demand for efficient, reliable, and sustainable energy systems. However, integrating these advanced technologies into smart grids faces challenges. The complexity of power systems, the need for real-time data processing, and the requirements for advanced security and privacy pose obstacles to both the power and technology industries. In addition, the wide variety of AI-based solutions and the need for seamless interoperability also add to the difficulties.

This special issue focuses on the latest breakthroughs in AI-assisted technologies for smart grids and explores how AI algorithms can optimize power generation and distribution, enhance grid stability, and promote the integration of renewable energy sources. From the predictive maintenance of grid infrastructure to real-time demand response management, the special issue delves into a wide range of applications. It also explores the application of AI in managing distributed energy resources (such as solar panels and wind turbines) and addressing the challenges of electric vehicle charging infrastructure.

Topics of interest include, but are not limited to:
A. AI-driven Power System Optimization
B. AI-supported Renewable Energy Integration
C. Cybersecurity in AI-enabled Smart Grids
D. Big Data Analytics for Smart Grid Operations
E. AI-based Demand Response Strategies
F. Distributed Energy Resource Management using AI
G. AI-enhanced Smart Grid Communication Networks
H. AI-enabled electric Vehicle Charging Management

Special Session Chair(s):

姓名 Name	Xu Xu (许旭)
称谓 Prefix	Assistant Professor (助理教授)
部门 Department	Department of Electrical and Electronics Engineering，, School of Advanced Technology （智能工程学院-电气与电子工程系）
单位 Organization	Xi'an Jiaotong-Liverpool-Liverpool University （西交利物浦大学）
城市/地区 City/Region	SuZhou, China 中国苏州

Organizer's Brief Biography

中文：许旭博士，江苏省双创博士人才。目前在西交利物浦大学智能工程学院担任助理教授、博士生导师以及可持续能源硕士项目专业主任。许旭博士毕业于香港理工大学电气工程专业并获得博士学位，还曾在香港理工大学、香港大学和新加坡南洋理工大学劳斯莱斯电力实验室进行博士后研究工作。在科研实践方面，许旭博士主持且深度参与多项国内外电网和工业领域研究项目，部分研究成果成功转化落地。此外，许旭博士多次受邀在国际能源领域会议作报告，并荣获最佳论文奖与最佳演讲报告奖。作为国际电气电子工程学会会员，许旭博士在多场国际能源领域会议中担当会议分会主席与技术委员会成员，近年发表了 30 余篇 SCI 和 EI 学术论文。

英文：Dr. Xu Xu is a talent of the "Double Innovation Doctor" program in Jiangsu Province. Currently, he serves as an assistant professor, doctoral supervisor, and the program director of the Master of Sustainable Energy at the School of Intelligent Engineering, Xi'an Jiaotong - Liverpool University. Dr. Xu Xu graduated from the Department of Electrical Engineering, The Hong Kong Polytechnic University, and obtained his doctorate degree. He has also conducted post - doctoral research at The Hong Kong Polytechnic University, the University of Hong Kong, and the Rolls - Royce Power Laboratory at Nanyang Technological University, Singapore. In terms of scientific research practice, Dr. Xu Xu has presided over and been deeply involved in a number of research projects in the power grid and industrial fields at home and abroad. Some of his research achievements have been successfully transformed and implemented. In addition, Dr. Xu Xu has been invited to give reports at international energy conferences on many occasions and has won the Best Paper Award and the Best Presentation Award. As a member of the Institute of Electrical and Electronics Engineers (IEEE), Dr. Xu Xu has served as the conference session chair and a member of the technical committee in many international energy conferences. In recent years, he has published more than 30 SCI and EI academic papers.

姓名 **Name**	Weitao Yao (姚巍涛)
称谓 **Prefix**	Assistant Professor (助理教授)
部门 **Department**	Department of Electrical and Electronics Engineering，, School of Advanced Technology （智能工程学院-电气与电子工程系）
单位 **Organization**	Xi'an Jiaotong-Liverpool-Liverpool University （西交利物浦大学）
城市/地区 **City/Region**	SuZhou, China 中国苏州

Organizer's Brief Biography

中文： 姚巍涛，2015 年在中国广州的华南理工大学获得电气工程及其自动化专业的工学学士学位。他分别于 2018 年和 2023 年在新加坡南洋理工大学获得电气工程专业的硕士和博士学位。在加入西交利物浦大学之前，他曾在新加坡南洋理工大学电气与电子工程学院的罗尔斯·罗伊斯-南洋理工大学联合实验室担任研究助理。2023 年，他加入西交利物浦大学，担任电气与电子工程系的助理教授。作为 IEEE 会员，他定期为一些 SCI 期刊和 EI 会议担任审稿人。近年来，他在多个顶级 SCI 期刊和 EI 会议上发表了多篇论文。他的研究兴趣包括微电网、电力系统稳定性、可再生能源的分布式控制以及信息物理系统。

英文： Dr. Weitao Yao received a B.Eng. degree in electrical engineering and automation from the South China University of Technology, Guangzhou, China, in 2015. He obtained his M.Sc. and Ph.D. degrees, both in power engineering from Nanyang Technological University, Singapore, in 2018 and 2023, respectively. Prior to joining XJTLU, he was a Research Associate in the Rolls-Royce@NTU Corporate Laboratory with the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. In 2023, he joined as an assistant professor in the Department of Electrical and Electronic Engineering, at Xian Jiaotong-Liverpool University. As an IEEE member, he regularly serves as the reviewer for some SCI journals and EI conferences. In recent years, he has published multiple top-tier SCI journals and EI conference papers. His research interests include microgrids, power system stability, distributed control for renewable energy, and cyber-physical systems.