

Special Session XIII

Special Session Basic Information:

专栏题目

Session Title

中文：新兴复杂系统可靠性与安全性的创新模型

英文：**Innovation Models in Reliability and Safety for Emerging Complex Systems**

专栏介绍和征稿主题

Introduction and topics

中文：近十年，随着人工智能（AI）技术的蓬勃发展，一些新兴复杂系统（城市空中交通、近地轨道卫星等）正介入我们的日常生活，并为社会带来新的经济增长点。随着新兴复杂系统不断面临各种挑战，包括意外中断、自然灾害和不可预见事件，可持续性的概念变得愈发重要，尤其是在可靠性和安全性方面。然而，由于安全要求、故障不确定性以及自主和智能行为等各种因素，新兴复杂系统的问题本质上十分复杂，这种复杂性使得精确建模和优化极具挑战性，往往需要一些新技术和解决方案。

- 新兴复杂系统的可靠性/安全性评估与建模
- 自主系统的故障诊断、预测与预防技术
- 新兴复杂系统的先进维护技术
- 人工智能赋能的新兴复杂系统可靠性/安全性解决方案
- 自主和智能系统的风险管理与决策框架
- 新兴复杂系统设计中的可靠性和安全性权衡
- 新兴复杂系统可靠性和安全性中的人为因素

英文： In the last decade, with the vigorous development of artificial intelligence (AI) technology, some emerging complex systems (urban air mobility, Low Earth Orbit satellite, etc.) are intervening in our daily life and bring new economic growth points to the society. As the emerging complex systems continue to face various challenges, including unexpected disruptions, natural disasters, and unforeseen events, the concept of sustainability has become increasingly important, especially for the reliability and safety. However, the problems of emerging complex systems are inherently complex due to various factors, such as safety requirements, failure uncertainty, and autonomous and intelligent behavior. This complexity makes precise modeling and optimization highly challenging, often necessitating some new technologies and solutions.

- Reliability/safety assessment and modeling for emerging complex systems
- Failure diagnosis, prediction and prevention techniques for autonomous systems
- Advanced maintenance techniques for emerging complex systems
- AI-enabled reliability/ safety solutions for emerging complex systems
- Risk management and decision-making frameworks for autonomous and intelligent systems
- Reliability and safety trade-offs in the design of emerging complex systems
- Human factors in reliability and safety for emerging complex systems

Special Session Chair(s):

	姓名 Name	Dongming Fan
	称谓 Prefix	Associate Professor
	部门 Department	Reliability and Systems Engineering
	单位 Organization	Beihang University
	城市/地区 City/Region	Beijing

Organizer's Brief Biography

中文：樊冬明,北京航空航天大学可靠性与系统工程学院副教授, 其在《Engineering》和《Reliability Engineering and System Safety》等期刊上发表了 66 篇论文, 其中 36 篇为第一作者或通讯作者。16 篇影响因子 (IF) 大于 10, 其中 1 篇被列为 ESI 高被引论文。他获得了众多科技奖项, 包括“北京市科技新星”称号、两项省部级科技进步一等奖、中国交通运输协会科技进步二等奖以及 ICRMS 和 ICIEA 的最佳论文奖。他的研究兴趣包括预测与健康管理、可靠性与安全性建模、弹性建模与优化、智能维护、智慧城市等。(电子邮箱: dongming_fan@buaa.edu.cn)

英文: Dongming Fan is currently an Associate Professor at the School of Reliability and Systems Engineering at Beihang University (BUAA), China. He has published 66 papers in the journals such as Engineering and RESS, including 36 as the first or corresponding author. Among them, 16 have an impact factor (IF) greater than 10, and one has been listed as an ESI highly cited paper. He has received numerous scientific and technological awards, including the “Beijing Science and Technology Star”, two first prizes for scientific and technological progress in provincial and ministerial level, one second prize for scientific and technological progress from the China Association of Transportation, and the Best Paper Award at ICRMS and ICIEA. His research interests include prognostics and health management, reliability and safety modelling, resilience modeling and optimization, smart maintenance, smart city and so on. (E-Mail: dongming_fan@buaa.edu.cn)

	姓名 Name	Huixing Meng
	称谓 Prefix	Associate Professor
	部门 Department	State Key Laboratory of Explosion Science and Safety Protection
	单位 Organization	Beijing Institute of Technology
	城市/地区 City/Region	Beijing

Organizer's Brief Biography

中文：孟会行于 2018 年在法国巴黎综合理工学院获得计算机科学博士学位。目前, 他是北京理工大学爆炸科学与安全国家重点实验室的副教授。此前, 他曾在北京清华大学工业工程系担任博士后研究员。他的主要研究兴趣包括能源系统的智能维护和风险控制。他已发表学术论文 40 余篇 (其中 SCI 期刊论文 20 余篇), 申请发明专利 11 项 (已授权 6 项)。他还获得了国家自然科学基金 (NSFC) 项目和中国科学技术部 (MOST) 的国际交流项目。同时, 他还是《安全科学》和《国际可靠性与安全杂志》的编委。(电子邮箱: huixing.meng@bit.edu.cn)

英文: Huixing Meng obtained the Ph.D. degree in Computer Science from the Ecole Polytechnique, Paris, France, in 2018. He is currently an Associated Professor at the State Key Laboratory of Explosion Science and Safety Protection, Beijing Institute of Technology, Beijing, China. Previously, he was a postdoctoral research associate in the Department of Industrial Engineering, Tsinghua University, Beijing, China. His major research interests include intelligent maintenance and risk control for energy systems. He has published over 40 academic papers (more than 20 SCI

journal papers) and applied 11 invention patents (with 6 granted). He has also been granted a project from Natural Science Foundation of China (NSFC) and an international exchange project from Ministry of Science and Technology of China (MOST). He serves as the editorial board member of Safety Science and International Journal of Reliability and Safety. (E-Mail: huixing.meng@bit.edu.cn)



姓名 Name	Aibo Zhang
称谓 Prefix	Associate Professor
部门 Department	School of Mechanical Engineering
单位 Organization	University of Science and Technology Beijing
城市/地区 City/Region	Beijing

Organizer's Brief Biography

中文：张爱波于 2021 年在挪威科技大学（NTNU）特隆赫姆分校获得机械与工业工程博士学位。目前，他是北京科技大学机械工程学院的副教授。在加入北京科技大学之前，他曾是香港城市大学的博士后研究员。他的研究主要集中在可靠性工程和维护优化方面。他的研究成果发表在《可再生能源》、《RESS》等期刊上。同时，他是《国际可靠性与安全杂志》的编委会成员。（电子邮箱：aibo Zhang@ustb.edu.cn）

英文：Aibo Zhang received the Ph.D. degree in Mechanical and Industrial Engineering from Norwegian University of Science and Technology (NTNU), Trondheim, Norway, in 2021. He is currently an Associate Professor at the School of Mechanical Engineering, University of Science and Technology Beijing (USTB), Beijing, China. Before joining USTB, he was a postdoc researcher in City University of Hong Kong. His research primarily focuses on reliability engineering and maintenance optimization. His work has been published in journals such as Renewable Energy, RESS, etc. He serves as the editorial board member of International Journal of Reliability and Safety. (E-mail: aibo Zhang@ustb.edu.cn)