

ESREL World 2027

23-26 April 2027, Chongqing, China

ESREL World 2027 brings together standout experts from academies and industries, who are providing speeches, communications, and ideas with inspirations for safe, reliable, resilient and intelligent engineering.

SPECIAL SESSION 15

TITLE: CYBER-PHYSICAL SYSTEMS AND PREDICTIVE MAINTENANCE FOR ENHANCED RELIABILITY AND AVAILABILITY IN INDUSTRY 4.0

DETAILED DESCRIPTION:

The development of Industry 4.0 has brought a paradigm change in the industry's approach to production and maintenance. This new era leverages cutting-edge technologies such as cyber-physical systems (CPS), the Industrial Internet of Things (IIoT) and advanced data analytics to create highly responsive and efficient industrial environments. The focus is on achieving higher levels of system reliability and availability through predictive maintenance and real-time decision making. Predictive maintenance complements this approach by moving from traditional, reactive maintenance strategies to more proactive ones. By harnessing the power of big data, machine learning and artificial intelligence, predictive maintenance enables early detection of potential equipment failures, preventing costly downtime and extending the life of equipment. This change not only reduces maintenance costs, but also significantly improves overall system reliability and availability. This special session aims to provide a platform for thought leaders, researchers, and industry practitioners to share their latest findings, innovations, and experiences. The session will cover a wide range of topics that are integral to the successful implementation of Industry 4.0 technologies, fostering an environment of collaborative learning and knowledge exchange.

Topics of interest include but are not limited to the following:

- Smart maintenance
- Robotics and mechatronic systems in maintenance
- Digital twins
- Multi-Agent Systems (MAS)
- Automation measuring systems and sensors
- Human-Machine Interaction and Machine-to-Machine Communication (M2M)
- Learning control and cognitive computing
- Reliability and risk assessment
- Cybersecurity applications in maintenance systems
- Simulation and modelling in maintenance
- Artificial intelligence in maintenance decision support systems
- Intelligent systems for predictive maintenance

ORGANIZERS:

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IMPORTANT DATES



30 November 2026

Extended Deadline for
Abstract Submission



15 December 2026

Notification of Abstract
Acceptance



31 January 2027

Extended Deadline for
Submission of Full Paper



15 February 2027

Notification of Full Paper
Acceptance



28 February 2027

Author's Registration
Deadline

More information: <https://esrelworld-2027.cqu.edu.cn/index.htm>