



The 14th International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering (QR2MSE2024)

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Special Session on:

Reliability modeling and analysis of complex systems considering imperfect information and mixed uncertainty

In mission-critical fields, e.g., infrastructure, manufacturing, aviation, and high-level national security, the rapidly growing and continuous evolution of technology have made products and systems increasingly complex. Such products and equipment are designed to meet advanced functional and reliability requirements, and unexpected failures during mission may lead to catastrophic consequences. Therefore, reliability modeling and analysis of complex systems have practical importance.

The reliability modeling should achieve the assessment at a reasonable confidence level, which can help decision-maker to arrive at practical decisions. However, reliability modeling of complex systems often have to face mixed uncertainty, due to either the inherent randomness (aleatory uncertainty) or a lack of knowledge (epistemic uncertainty). Particularly, the available information for reliability modeling is often imperfect, arising from insufficient accumulated knowledge, biased prior information, limited field test data, etc. This makes reliability analysis considering imperfect information and mixed uncertainty an imperative yet difficult task.

The objective of this special session is to bring the latest innovative ideas, cutting-edge research results, and applications for complex system reliability modeling and analysis. Applications in practical industrial cases will also be included.



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