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SS-18: Risk, Reliability and Safety of Autonomous Systems (IWASS)

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Description

Autonomous systems are increasingly being deployed in safety-critical domains such as transportation, manufacturing, and agriculture. Their potential to operate with minimal human intervention promises transformative benefits, including improved efficiency, scalability, and adaptability. At the same time, these systems must function in uncertain and dynamic environments, often make real-time decisions, and may be required to interact and collaborate with humans or other agents.

These are some of the characteristics that introduce unique challenges for risk assessment, safety assurance, and reliability engineering of autonomous systems. Traditional methods frequently fall short when applied to autonomous systems; for example, difficulties arise in modeling emergent behavior in learning-enabled systems, validating performance across diverse and dynamic operating conditions, or ensuring that a system can reliably fall back to a safe state. Importantly, such challenges are not limited to a single sector. Across transportation, maritime, aerospace, agriculture, and industrial automation, such common challenges emerge.

This special session focuses on the shared challenges of risk assessment, safety assurance, and reliability engineering across autonomous system applications and disciplines. It aims to bring together experts from academia, industry, and government to exchange perspectives, share methods for risk modeling, reliability engineering, and assurance frameworks, and identify techniques that can advance the successful deployment of autonomous systems.

Topics of Interest

- Risk assessment and modeling methods
- Safety assurance frameworks and certification approaches
- Reliability engineering, robustness, and fault tolerance
- Risk and safety monitoring and safe fallback strategies
- Domain case studies, lessons learned, and best practices
- Ethical, legal, and regulatory frameworks for autonomy