



International

*Innovation in Knowledge Based and Intelligent
Engineering Systems*



INVITED SESSION SUMMARY

Title of Session:

Intelligent Critical Infrastructures

Name, Title and Affiliation of Chair:

Laura Verde, Dr, Department of Mathematics and Physics, Università degli Studi della Campania "Luigi Vanvitelli"

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Details of Session (including aim and scope):

Critical infrastructures (CIs) are an inevitable part of the modern interconnected world. The main objective of critical infrastructure is to protect and preserve communities from risks that are essential for the economic and social well-being of citizens. Infrastructure resilience is essential to withstand and adapt to changing conditions and recover positively from accidental attacks and other factors, avoiding disruptions that can negatively impact security and continuity of services. Furthermore, while increasing digitisation and connectivity enables the technological transformation of critical infrastructures resulting in productivity and efficiency improvements, it also increases vulnerabilities for such infrastructures.

Recent advances in artificial intelligence (AI) can be harnessed to understand hazards, risks, vulnerabilities and resilience gaps and increase the protection of critical infrastructure. On the other hand, Digital Twins (DT) can enable real-time synchronisation and monitoring of complex systems through computer and virtual modelling, integrating observational and system simulation data, information and consumer behaviour for effective risk assessment and decision-making.

This Session will present both review and original research articles related to use and propose of intelligent technologies able to mitigate failures and increase resilience of critical infrastructure, including anomaly detection, resilience strategies, security.

This Session covers but is not limited to the following topics:

- Recent developments in AI algorithms for improving resilience in critical infrastructures failures
- AI for data clustering, prediction and classification of CIs failures
- Resilient AI-Based models for securing CIs
- Measures to improve data protection and privacy in CIs
- Digital twin for predictive maintenance and performance prediction
- Digital twin for process control
- Applications of digital twin
- Innovative methods, tools, and technologies for the monitoring, control, management, and security of CIs

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