International

Innovation in Knowledge Based and Intelligent Engineering Systems

INVITED SESSION SUMMARY

Title of Session:
Resilience paradigms to promote 5.0 sustainable transition

Name, Title and Affiliation of Chair:

Prof. Marco Bortolini, Ph.D.
Associate Professor
Department of Industrial Engineering
Alma Mater Studiorum – University of Bologna, Italy

Dr. Francesco Gabriele Galizia, Ph.D.
Assistant Professor
Department of Industrial Engineering
Alma Mater Studiorum – University of Bologna, Italy

Details of Session (including aim and scope):

Industry 5.0 (I5.0) enhances the Industry 4.0 (I4.0) paradigm by emphasizing the crucial role of sustainability, resilience and human-centric processes. While safety is the primary target, I5.0 extends to broader issues, emphasizing the interaction between humans and advanced technologies. The current trend towards data-driven approaches, including data analysis, digital twins and simulations, further enriches this paradigm, offering numerous opportunities for integrating innovative technologies, models and processes. At the same time, it introduces new challenges related to the resilience of systems, which are now vulnerable to novel types of attacks and unforeseen consequences. To fully realize I5.0's potential, it is crucial to investigate and emphasize the resilience of systems toward a long-term multi-echelon sustainability patter.

The aim of this Invited Session is to attract contributions from Academics and Industrial Practitioners focusing on innovative technologies, models, tools, and exemplary experiences, i.e. paradigms, that address the resilience-related spectrum within the challenging framework of the I5.0 sustainability transition. Contributions may include reviews, original models, quantitative methods, advanced technologies, and disruptive approaches. Additionally, industrial case studies, field experiences and financed projects' outcomes are welcomed showcasing good strategies for enhancing system resilience to novel threats.

In particular, topics include, but are not limited to:

- Resilience paradigms within Industry 5.0 sustainability transition
- Resilience engineering methods and design models
- Resilience engineering industrial case studies
- Resilience-oriented process optimization and systems' integration
- Resilience-oriented risk management strategies

- Industry 5.0 resilience-oriented challenges
- Machine learning and artificial intelligence for resilience systems
- Resilience and sustainability metrics
- Cyber-socio-technical-systems framework and practice
- Human-Machine interaction in cyber-socio-technical-systems
- Digital twin frameworks and applications in smart manufacturing
- Digital twin industrial integration toward sustainability
- Machine learning and artificial intelligence for digital twins

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Researchers and Professors from Industrial Systems Engineering research groups in Italy;
Researchers and Professors from the Italian Academic Industrial Plant Association;
Researchers and Professors from Bologna University, Sapienza University in Rome and Polytechnic of Marche University in Ancona;
Researchers and Professors from Universities in partnership with Bologna University (tentative);
Researchers from Interdepartmental Centres for Industrial and Applied Research (tentative);
Managers and Practitioners from SMEs and large-scale industries.

Website URL of Call for Papers (if any):

Dedicate positions on:
https://www.unibo.it/sitoweb/marco.bortolini3/en
https://www.unibo.it/sitoweb/francesco.galizia3/en
http://www.industrial-engineering.unibo.it/en
and dedicated messages to researchers and practitioners mailing lists.

Email & Contact Details:

E-mail addresses: marco.bortolini3@unibo.it; francesco.galizia3@unibo.it.