

**INVITED SESSION ON  
Knowledge and sensing services for the Factory of the Future applications**

**(code xxxxx)**

Sponsored by

- IFAC TC 5.3 “Enterprise Integration and Networking” (to be confirmed)
- IFIP TC 12 “Artificial Intelligence” (to be confirmed)
  - WG 12.1 - Knowledge Representation and Reasoning
  - WG 12.6 - Knowledge Management

**Organisers**

Mario Lezoche, Université de Lorraine, France ([mario.lezoche@univ-lorraine.fr](mailto:mario.lezoche@univ-lorraine.fr))  
Yasamin Eslami, Ecole Centrale de Nantes, France ([yasamin.eslami@ec-nantes.fr](mailto:yasamin.eslami@ec-nantes.fr))  
Chiara Franciosi, Università degli studi di Salerno, Italy ([cfranciosi@unisa.it](mailto:cfranciosi@unisa.it))

**Keywords:** Knowledge formalisation, Internet-of-services, Enterprise Information Systems, System-to-System communication, Systems Interoperability, Factory of the future, Industry 4.0, Cyber-physical System, Data fusion, multi-sensor data fusion, Artificial Intelligence

**Scope:**

Systems integration, cooperative communication and information processing technologies for enterprise operations represent some key focus in the new global market. These issues are closely intertwined to information processing and distributed information systems, where the knowledge technologies play a major role. This evolution context brings about the concept of smart services as next-generation services provided via all the possible technological channels but, at the same time, the challenge of a different vision of manufacturing operations management.

The Factory of the Future (FoF) revolution, deeply related to the Industry 4.0, is thus focused on developing a smart physical environment where the production is interlaced with knowledge: matter and information as two faces of the same medal. It is the current trends of automation and data exchanges in manufacturing technologies that include development of cyber-physical systems, cognitive computing, cloud computing, Internet of Things among the most known technologies. The development of knowledge sharing for manufacturing operations led to important results in various domains practices: the development of accuracy and transparency in several industrial contexts. Simultaneously, other new challenges are arising and becoming subjects of research: the key necessity to enable data exchanges in the business ecosystem and the need to invest in new physical infrastructure and tools. In collaborative and cooperative environments, the enterprises have been exploring several aspects of their processes and services to determine which ones can be better managed through ICTs. Nowadays, these services are also facing the need of integrating physical and virtual objects through the exploitation of data capture and communication capabilities. To overcome challenges related to acquisition and analysis of a large amount of data, the Data Fusion strategy has gained focus as a data pre-processing phase to support the fast-growing data-intensive applications.

FoF is using advanced technologies such as networking sensors, smart devices, sensing machines, robots, GPS technology, which will allow enterprises to be more profitable, efficient, safe, and environmentally friendly, and therefore to achieve a more sustainable operations management. This impulse is completely towards the development of cooperative services and applications. These

innovative services have to meet the requirements of a high degree of autonomous data capture, event transfer, network connectivity and interoperability as a support of the physical transformations.

In order to optimise their knowledge processes and services, enterprises use acquired and innovative technologies, such as wireless network, remote sensor data acquisition, mobile information technology, services and processes architectures managing the operations of the enterprise systems. Based on innovative services, this requires the conceptualisation and the formalisation of the models and methods that generalise proposed services in every heterogeneous system.

This Invited Session on “**Knowledge and sensing services for the Factory of the Future applications**” focuses on presenting the latest research achievements of the scientific community within the above-mentioned perspectives and trends.

Authors are invited to submit original contributions on all aspects including but not limited to:

- Knowledge formalisation methods
- Distributed Information Systems: Models, Architecture and Frameworks
- Systems Interoperability
- Web Services in IoT context
- Sensing services: innovative technologies and processes
- Internet-of-Things: innovative technologies and methods
- Cyber-Physical Systems
- Multi sensors Data Fusion
- Smart Communicative Objects
- System to System Communication
- Semantic Interoperability in Internet-of-Things and Internet-of-Services
- Wireless Technologies and Architectures
- ICT Infrastructures/Platforms for Mobility
- Conceptual Modelling and Simulation of Distributed Technologies
- Process Modelling and deployment of Cooperative Information System
- Advanced and smart manufacturing technologies
- Smart sensing system for sustainable operations in manufacturing enterprises
- Knowledge management for manufacturing operations
- Knowledge Graphs for manufacturing and interoperability.

Papers must be submitted electronically using the IFAC PaperPlaza Conference Manuscript Management System: [www.ifac.papercept.net](http://www.ifac.papercept.net). All submissions must be in PDF format, written in English, and prepared according to the IFAC format.

Please visit [www.ifac.papercept.net/conferences/manuals/authorgetstarted.pdf](http://www.ifac.papercept.net/conferences/manuals/authorgetstarted.pdf) for detailed instructions. Papers submissions will be due before **December 25<sup>th</sup>, 2021** through the conference submission platform, selecting “invited paper” and entering the session **code xxxxx**.

Distinguished papers based on their fast-track review and oral presentation will be selected and published in an extended journal article form as part of a special issue.