



## IFAC 2017 World Congress, Toulouse, France

*The 20th World Congress of the International Federation of Automatic Control, 9-14 July 2017*

Open invited track:

Interoperability in Cyber Physical Smart & Sensing Systems

Session code: 4u432

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IFAC Technical Committee for evaluation: TC 5.3 "Enterprise Integration and Networking"

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**Abstract:** The sensing enterprise<sup>1</sup> is a digital business innovation concept making Internet of Things, Service Oriented Architectures and Advanced Human Computer Interactions converge for more agile, flexible and proactive management of unexpected events in the global value networks of today. In essence, it concerns the adoption of Future Internet technologies for the virtual enterprise and its value network. Translating the same concept to **production systems** in manufacturing enterprises, and moreover to Smart Systems in general (smart manufacturing, smart cities, smart logistics ...), the capability by next generation systems sensing, modelling and interpreting the signals from the real world is a pre-requisite for a more flexible and agile reconfiguration of those smart systems. Intuitively, a sensing system requires resources and machineries to be constantly monitored, configured and easily interacted by blue collar workers. All these functions, and much more indeed, are now implemented by so-called Cyber Physical Systems (CPS)

*Cyber-physical systems (CPS) enable the physical world to merge with the virtual leading to an Internet of things, data and services. One example of CPS is an intelligent manufacturing line, where the machine can perform many work processes by communicating with the components. Using sensors, the embedded systems monitor and collect data from physical processes, like steering of a vehicle, energy consumption or human health functions. The systems are networked making the data globally available. Cyber-physical systems make it possible for software applications to directly interact with events in the physical world, for example to measure peaks in energy consumption.*<sup>2</sup>

<sup>1</sup> <http://www.theinternetofthings.eu/sites/default/files/%5Buser-name%5D/Sensing-enterprise.pdf>

<sup>2</sup> <http://www.eitictlabs.eu/innovation-areas/cyber-physical-systems/>

With advent of the new paradigms of Industrial Internet-of-Things and Cyber-Physical Systems, the number and the diversity of systems that need to work together in the future enterprises have significantly increased. This trend highlights the need to shift the interoperability paradigm from the classic consideration of interoperating pair of systems, towards the interoperability as a capability to sense and perceive the exchanged messages, as well as to purposefully and socially act upon their perceptions. Such a shift could have important consequences on the future architecture design of these systems. The emergence of cloud based technologies will have a significant impact on the design and implementation of cyber physical systems; using such novel technologies, collaborative engineering practises will increase globally which will enable a new generation of small scale industrial organizations to function in an information centric manner. The potential of such technologies in fostering a leaner and more agile approach towards engineering is also very high. Engineers and engineering organizations no longer have to be restricted to the availability of advanced processing capabilities but can adopt a ‘pay as you go’ approach which will enable them to access and use software resources for engineering activities from any remote location in the world.

The topics of interest include, but are not limited to:

- Smart Systems Interoperability
- Cyber Physical Systems modelling and applications
- Industrial Internet-of-Thing (IIOT)
- Cyber Physical Production Systems
- Cyber Manufacturing Systems
- Cyber Logistics Systems,
- Cyber Enterprise Systems
- CPS for Control in Smart Cities Systems/Transportation/Energy/Water
- Industry 4.0
- Sensing Systems
- Model-driven sensing engineering
- Ontology-based models for CPS/IIOT
- CPS for Future Internet Enterprise Systems
- Cloud-based CPS

Submission shall respect the normal procedure: <https://www.ifac2017.org/submit>

The authors have to select « **open invited track paper** » as submission type and use the track code (**4u432**) at the second step of submission.

If the theme of the paper is not suited to the track scope, the paper will be evaluated and considered for a regular session.

Please send an email with your intention to submit a paper to: [herve.panetto@univ-lorraine.fr](mailto:herve.panetto@univ-lorraine.fr) and [rg@uninova.pt](mailto:rg@uninova.pt)

### **Key dates**

31 October 2016: Paper submission deadline

20 February 2017: Notification to authors

31 March 2017: Final paper submission deadline

15 April 2017: Early registration rates expire

9-14 July 2017: IFAC World Congress in Toulouse