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Open invited track

Interoperability in the Cyber-Physical Enterprise

Session code: **3ig8y**

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Abstract: The cyber-physical enterprise 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 in the frame of the Factory of the Future paradigm, 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.[1]

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[1] 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 technologies and concepts
- Sensing and Smart Enterprises/Manufacturing Systems
- Model-driven sensing engineering
- Ontology-based models for CPS/IIOT
- CPS for Future Internet Enterprise Systems
- Cloud-based CPS

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Please send an email with your intention to submit a paper to: herve.panetto@univ-lorraine.fr and georg.weichhart@profactor.at

A Special section of the **Annual Reviews in Control Journal** (I.F.4,759) is planned with extended version of the accepted papers.

Key dates
31 October 2019 - Draft manuscript submission
February 2020 - Notification to authors
31 March 2020 - Final paper submission deadline