

Invited Session on

Bio-inspired Techniques in Future Manufacturing Enterprise Control

Proposed by :

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Session purpose description:

Manufacturing enterprises are systems heterogeneous in nature, whose functioning is emerging from the coordinated behavior of several differently organized departments – from manufacturing to marketing, management, logistics, acquisition, design a.s.o. The particular objectives and functioning of each department are impacting the others, in a highly interconnected complex network, in which local optimization criteria are often conflicting. Many of the local control and supply chain management problems have been addressed and solved, but the emergent behavior of the overall system still represents a problem to be solved, despite the tremendous advances in IT, control and communication. Holistic paradigms in enterprise control, as smart manufacturing, are trying to implement a “human in the loop” approach, in order to benefit from the human brain still unequaled capacity of solving weak-defined and new problems, based on incomplete data. Other approaches which are simulating biological systems functioning, as neural networks and swarm intelligence are also used with local success.

Large scale, complex systems are modeled as networks of cooperating self-sufficient/ embedded agents (Cyber-Physical Systems being the ultimate generalization), inherently suggesting the organization of a living organism whose behavior and adaptability is emerging from the cooperative synchronized control of its different parts. It is therefore normal to search in biology for solutions of complex control problems in manufacturing, logistics, transportation etc.

This session invites researchers to consider a deeper biological approach in order to propose new models, tools and techniques in manufacturing control, starting with **perception** (what and how to take into account from sensory information), passing by **reasoning** (problem/

knowledge modeling and recognition, when and how to change the problem solving existing approaches) and ending with **learning** (organizational memory, knowledge management, knowledge sharing a.s.o).

Topics of interest include (but are not limited to):

- sensing and measurement
- intelligent control
- agent-oriented integrative information architectures
- supply chain management
- knowledge management
- cognitive manufacturing

Submission guidelines

For author guidelines, please refer to <https://blog.hwr-berlin.de/mim2019/submission/>.

All papers must be submitted via the IFAC Papercept platform at the following address: <http://ifac.papercept.net/conferences/scripts/start.pl>.

All papers must be prepared in a two-column format in accordance with the IFAC manuscript style. Please use the official IFAC instructions and template to prepare your contribution as full-length draft paper and submit it on line by December 15th , 2018. Submission details are available on the symposium website. All submissions must be written in English. All papers that conform to submission guidelines will be peer-reviewed by IPC members. Submission as an invited paper requires the invited session code.

Important dates

- 15 December 2018 Paper submission deadline
- 20 February 2019 Notification to authors
- 15 March 2019 Final paper submission deadline