

**Session title: Adaptive and self-organized Multi-Agent Systems - AMAS****Organisers:**

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**Short presentation:** Multi-Agent Systems and Holonic Multi-Agent Systems, mainly developed and implemented in Manufacturing Systems, are more and more used in other fields such as complex system simulations, information systems, etc.

Holonic Multi-Agent Systems are flexible; in a hierarchical organization they are reflecting pyramidal control architectures. They really have an interesting potential for the smart enterprise of the future; however, methods and tools to facilitate their design and management, in particular regarding to their self-adaptation and self-organization capacities, are required.

Indeed, the main characteristics of a Holonic Multi-Agent System (HMES) – agility and robustness – achieved through reconfigurability and cooperation, are dependent of the multi-agent system's dynamics.

Agility of a production structure to dynamic market changes is obtained by agent-based shop floor reconfiguring, whereas robustness enables the multi-agent systems to cope with perturbations, faults and hard constraints. Implementing such properties is typically a self-organization problem where regeneration of faulty agents, generation of new agents and/or migration of agents between Multi-Agent Systems represent solutions for such problems.

Cooperation means that if each agent has classically its own goals and strategies in a hierarchic or heterarchic topology, all agents have to collectively lead the multi-agent system to its intended global goal. This property is generally used by locally and autonomously modifying agents' roles or behaviours, by adapting their strategies; it is a self-adaptation of the agents / holons. Emergence of behaviours, roles or organization is a reality in Holonic Multi-Agent Systems and has to be analysed and controlled.

This Special Session of SOHOMA welcomes presentations of models and methods related to robustness and cooperation in multi-agent systems, enabling emergence of new behaviours and sub-organization.

The main topics of this session include:

- Multi-Agent Systems for complex applications
- Adaptive and self-organized Multi-Agent Systems
- Agility and robustness of Multi-Agent Systems
- Semi-heterarchical Manufacturing Execution Systems
- Fault-recovery in industrial systems with distributed intelligence

**Keywords:** multi-agent systems, holonic manufacturing, self-organisation, cooperation, fault-recovery, robustness, distributed control.

**Important dates:**

- Full Paper Submission: May 22, 2014
- Notification of Acceptance: June 22, 2014
- Final Paper Submission: September 8, 2014