

ETFA2008_SS_07

Invitation to the Special Session on Supervision of Networked Control Systems

**at the 13th IEEE International Conference on Emerging Technologies and
Factory Automation**

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Conference web site: <http://www.etfa2008.org>

There is a strong demand from industry for the implementation of multi-level plant wide networking systems addressing safety-critical issues. Multilevel communication architectures enable new requirements such as modularity, control decentralisation and/or distribution, integrated diagnostics, computing redundancy, quick and easy maintenance etc, to be met. The Networked Control System (NeCS) concept can provide many advantages giving rise to the possibility of satisfying these requirements. Furthermore, with the aid of standard interfaces, component interchangeability and interoperability represent important common features of NeCS.

NeCS are based on specific networks called fieldbuses such as DeviceNet, Fieldbus Foundation, InterBus-S, LonWorks, Profibus (Process Field Bus), CAN (Controller Area Network), WorldFIP (Factory Instrumentation Protocol), and others. They interconnect programmable controllers, CNC, robots, actuators, sensors and further field components to exchange technical data for monitoring, controlling and synchronising industrial processes. These networks are interconnected with upper level ones to enable the information system existence inside the company (downloading of programs, production planning broadcasting, etc.) and outside (informational continuity of a multi-site plant, remote-maintenance, etc.). In this way and to be compliant with the IEC 1508 standard, implementation of multilevel plant wide networking systems coping with safety critical issues represent also a strong demand from industry.

Clearly, the evolving technology of network control systems gives rise to major challenges and opportunities to control theory and methodologies. However, this subject is not only concerned with a distribution or a network of computers or controllers. Thus, an integrated solution offering a synergy between communications, computation and control represents a new investigation area to fault diagnosis and fault tolerant control. Conventional fault detection and isolation (FDI) / fault tolerant control (FTC) and control design theories with ideal assumptions, such as synchronised control, non delayed sensing and actuation must be adapted to the new paradigm of NeCS. In particular, few significant theories exist in fault management and autonomous operating condition. Strong efforts are still needed in order to make the various theoretical results or methods in the control field applicable to networked systems

The systems under consideration can be considered as a distributed network of nodes operating under highly decentralised control, but unified in accomplishing complex system-wide goals. One of the key factors in designing such a complex system is that both the physical subsystem and the control part have to be designed together in an integrated way.

Authors' Schedule:

Authors should contact the Special Session Organizers as soon as possible

Deadline for submission: **April 30, 2008**

Notification of papers acceptance: **June 1, 2008**

Final manuscripts due: **July 1, 2008**

Submission of Papers:

Papers are to be submitted electronically. For further details please consult the conference web pages.

Session Organizers:

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