



Call for Papers / Invitation to Special Session SS07

DISTRIBUTED AUTOMATION SYSTEMS DEVELOPMENT: TRENDS AND CHALLENGES

Special Session Organizers

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Aim: The always increasing complexity of Industrial automation systems and the need for distribution in this domain, as well as the need for agility, flexible plug-and-play, extensibility and evolution, impose the need for new paradigms to effectively address today's requirements. The IEC61499 Function Block model is an attempt to exploit current software engineering practices, promote the application-centric paradigm and support Distribution. The emerging OO extension of 61131 is another attempt to this direction that also focuses on Distribution. However, the dramatic increase of complexity, the increased demand for inter-networking, reuse, shortened development cycles, security and safety issues, impose the need for more abstract models to be applied in the engineering process of Distributed industrial automation systems (DIAS). New approaches, such as Model Driven Engineering (MDE), UML, SysML from the computer domain, variability modelling from product line engineering and synergistic integration from Mechatronics, are emerging and best practices that can be specialized to address the needs of DIAS development. A few standards are already in the road of addressing this trend but there is also a need for new standards in the domain. Integration with existing process and automation engineering methodologies and tools is also a great challenge in this domain. Existing standards, such as 61512, 61804, 62424, attempt to reduce engineering cost and system implementation time, as well as to increase reliability and maintainability of the whole system through simplified migration from existing systems and adoption of current software engineering technologies. The integration with mechanical process engineering brings new challenges. The main objective of this Special Session, which is the 7th in this subject (see the reports of the 1st, 2nd, 3rd, 4th, 5th, and 6th SSs), is to address the limitations of current practices, and discuss on new approaches and standards in this domain. Theoretical issues related to specifications as well as the use of existing or new methodologies and standards in practice will be presented and discussed. More specifically topics include, but are not limited to the following: - The challenge of Model-driven development (UML, SysML, domain-specific languages, Mechatronics), -the opportunities of variability modelling from product line engineering to cope with complexity in engineering of mechatronic systems, - System architectures, development processes, design alternatives on IEC standards (e.g. 61131, 61499, 62424, etc), - Extensions and modifications to the IEC models, Case studies and comparative evaluations, - Integration or combination of IEC standards (e.g. IEC 61499 with IEC 61512, IEC 61131 with IEC 61499), - Experimental developments, real-world examples, experience reports, industrial acceptance, - Discussions on strengths and weaknesses of standards and emerging approaches.

SUBMISSION OF PAPERS

Papers should be submitted electronically. For further details, please refer to the conference web page.

AUTHOR'S SCHEDULE

Deadline for submission of papers: April 8, 2012

Notification of papers acceptance: May 30, 2012

Final manuscripts due: July 8, 2012

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