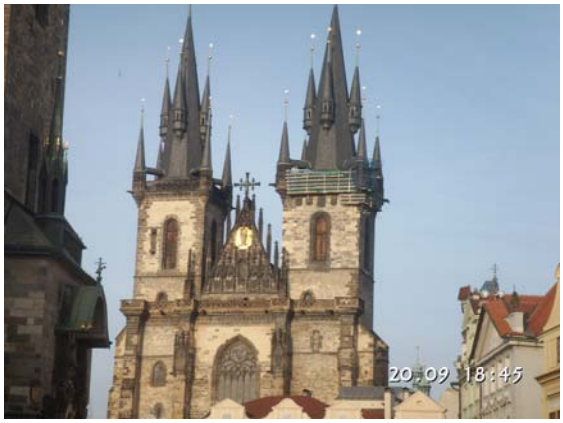
Special Session
The IEC 61499 Function Block Model in Factory Automation
The world's 1st Special Session on IEC61499

Special Session Report

ETFA'06 (20-22 Sept) hosted the world's 1st Special Session on the IEC61499 Function Block model. This Special Session was an attempt to bring together leading research groups from academia and industry to present their latest work, exchange ideas and propose solutions to the open issues of this standard. It was one of the most successful sessions of the ETFA'06 conference and attracted a wide interest from academia and industry.



IEC 61499 is a key standard towards an open market in the control and automation domain. It is the IEC's proposal to address the demand for distribution and interoperability in today's complex control and automation applications. It exploits current software engineering practices such as the object technology and component based development to improve the development process of distributed control applications.

However, several issues are still open for the standard to be adopted by industry. Significant progress should be obtained in the verification process of the design models, the development of flexible and reliable execution environments, the deployment and the reconfiguration process. Research groups from Helsinki University of Technology, University of Hanover, PROFACTOR GmbH, Vienna University of Technology, University of Kaiserslautern, Nancy Univeriste, Martin-Luther-University, Chalmers University of Technology, and University of Patras, presented their latest work on the IEC 61499 standard.

We thank all participants for their hard work, co-operation and commitment. It is they who have made this 1st Special Session on IEC61499 a success and made us to decide to organize the 2nd Special Session on IEC61499 during ETFA'07 at Patras, Greece.

Kleanthis Thramboulidis
Special Session Organizer
Software Engineering Group (SEG), University of Patras, Greece

Special Session Structure in brief

Twelve papers were presented in two sessions: SS01A and SS01B.

SS01A

Six papers were presented in this session: Mika Stromman presented the results of an intensive course they have organized on IEC61499, to examine the work practices of professionals and researchers and the way these practices influence the adoption of IEC61499 features. Nils Hage presented a comparative study of IEC61499 with Statecharts, a mature modelling technique, and CNet, a new component based modelling language derived from Petri nets. Kleanthis Thramboulidis presented several design alternatives to improve the expressiveness and reliability of the IEC61499 design diagrams and improve productivity in the development process. Seno Panjaitan presented an integration of UML with the IEC61499 Function Block model in attempt to bring the gap between designers from automation engineering and software engineers. Valeriy Viatkin presented a new approach for modelling and verification of function block applications based on the logic programming language Prolog. Goran Cengic presented a framework for component based development of distributed control applications and the way of executing an application developed with this framework using the IEC61499 Function block model.

SS01B

Six papers were also presented in the second session: Goran Cengic presented an approach for the formal modelling of function block applications in IEC61499 execution environments. Tanvir Hussain presented an approach for the automatic generation of test-cases in the context of a development process that integrates the Function Block model with UML. Christoph Sünder presented an approach for the reconfiguration process of IEC61499 applications using the function block as basic construct for the modelling of the reconfiguration process. Mohamed Khalgui presented a hybrid scheduling approach for the allocation and scheduling of software components on the network of interconnected devices. Marco Colla presented their on going work to develop a toolset to support this process, as well as, the experience from applying the IEC61499 function model in the Shoe manufacturing sector. Kleanthis Thramboulidis presented a service based architectural framework to show the way that the currently closed control and automation market can be transformed to an open demand-led market where small vendors will play a significant role.

For Special Session program see http://seg.ece.upatras.gr/seg/dev/SS01Programme.htm