ICONS 2012

Foreword

The Seventh International Conference on Systems [ICONS 2012], held between February 29th and March 5th, 2012 in Saint Gilles, Reunion Island, continued a series of events covering a broad spectrum of topics. The conference covered fundamentals on designing, implementing, testing, validating and maintaining various kinds of software and hardware systems. Several tracks were proposed to treat the topics from theory to practice, in terms of methodologies, design, implementation, testing, use cases, tools, and lessons learnt.

In the past years, new system concepts have been promoted and partially embedded in new deployments. Anticipative systems, autonomic and autonomous systems, self-adapting systems, or on-demand systems are systems exposing advanced features. These features demand special requirements specification mechanisms, advanced behavioral design patterns, special interaction protocols, and flexible implementation platforms. Additionally, they require new monitoring and management paradigms, as self-protection, self-diagnosing, self-maintenance become core design features.

The design of application-oriented systems is driven by application-specific requirements that have a very large spectrum. Despite the adoption of uniform frameworks and system design methodologies supported by appropriate models and system specification languages, the deployment of application-oriented systems raises critical problems. Specific requirements in terms of scalability, real-time, security, performance, accuracy, distribution, and user interaction drive the design decisions and implementations. This leads to the need for gathering application-specific knowledge and develop particular design and implementation skills that can be reused in developing similar systems.

Validation and verification of safety requirements for complex systems containing hardware, software and human subsystems must be considered from early design phases. There is a need for rigorous analysis on the role of people and process causing hazards within safety-related systems; however, these claims are often made without a rigorous analysis of the human factors involved. Accurate identification and implementation of safety requirements for all elements of a system, including people and procedures become crucial in complex and critical systems, especially in safety-related projects from the civil aviation, defense health, and transport sectors.

Fundamentals on safety-related systems concern both positive (desired properties) and negative (undesired properties) aspects. Safety requirements are expressed at the individual equipment level and at the operational-environment level. However, ambiguity in safety requirements may lead to reliable unsafe systems. Additionally, the distribution of safety requirements between people and machines makes difficult automated proofs of system safety. This is somehow obscured by the difficulty of applying formal techniques (usually used for equipment-related safety requirements) to derivation and satisfaction of human-related safety requirements (usually, human factors techniques are used).

This conference also featured the workshop:

- VisGra 2012, The First International Workshop on Computer Vision and Computer Graphics

We take here the opportunity to warmly thank all the members of the ICONS 2012 Technical Program Committee, as well as the numerous reviewers. The creation of such a broad and high quality conference program would not have been possible without their involvement. We also kindly thank all the authors who dedicated much of their time and efforts to contribute to ICONS 2012. We truly believe that, thanks to all these efforts, the final conference program consisted of top quality contributions.

Also, this event could not have been a reality without the support of many individuals, organizations, and sponsors. We are grateful to the members of the ICONS 2012 organizing committee for their help in handling the logistics and for their work to make this professional meeting a success.

We hope that ICONS 2012 was a successful international forum for the exchange of ideas and results between academia and industry and for the promotion of progress in the field of systems.

We are convinced that the participants found the event useful and communications very open. We also hope the attendees enjoyed the charm of Saint Gilles, Reunion Island.

ICONS Chairs:

Raimund Ege, Northern Illinois University, USA
Hermann Kaindl, Vienna University of Technology, Austria
Leszek Koszalka, Wroclaw University of Technology, Poland
Daniela Dragomirescu, LAAS-CNRS / University of Toulouse, France

VisGra Chairs:

Petre Dini, Concordia University, Canada / China Space Agency Center, China
Vaclav Skala, University of West Bohemia, Plzen and VSB-Technical University, Ostrava, Czech Republic