First Winter School on :

"Self-Organization in Embedded Systems"

22 – 24 November 2006
Schloss Dagstuhl

Introduction

Within the framework of the Franco-German school doctoral, the purpose of the winter school (WS) 2006 between the Universities of Lorraine, Metz and Nancy, and the University of Kaiserslautern is to bring researchers and students from the involved universities together in order to present their work in self-organizing systems and allow some exchange between the PhD students and different researchers involved or not in the German-French University.
The school is part of the annual program between the involved universities in their effort to enforce a continuous exchange of students and researchers from both sides, a common organization of workshops and the participation in common projects in order to improve the quality of

teaching and research in the involved universities and to provide to students the benefits of experiencing the cultural and technical differences offered by the two countries.
The topic of research is the investigation of Self-Organization with the focus on embedded systems. Increasing complexity, due to rapid progress in information technology, makes systems more and more difficult to integrate and to control. Due to the large amount of possible configurations and alternative design decisions, the integration of components from different manufacturers into a working distributed and connected system at compile time is often impossible. Systems must be designed to cope with unexpected run-time environmental changes and interactions. They must be able to organize themselves and to adapt to change in order to optimally process the load we put on them while avoiding fatal behavior.
The design of self-organizing embedded systems cannot be done only with the traditional design methods anymore. Self-organization (self-configuration, self-optimization, self-healing and self-protecting) must be considered to some extent.
Self-organization can be seen as a process in which patterns at the global level of a system emerge solely from numerous interactions among the lower-level components of the system. Moreover, the rules specifying interactions among the system's components are executed using only local information, without reference to the global pattern.
Natural systems have evolved to deal with dynamism, unpredictability, uncertainty and lack of guarantees. Several initiatives (**Autonomic Computing, Swarm Intelligence, Organic Computing**) were founded with the goal of designing and building highly reliable and robust systems by copying the properties of natural systems. However, substantial efforts and competencies from different fields are required in order to make the dream of autonomic and organic computing come true.

We are interest in having researchers from different fields, ranging from algorithmic and architecture of computing systems, to pattern recognition and robotics, interacting with students in order to provide a broad knowledge and a strong basis required in designing and implementing self-organization in distributed embedded systems. The variety of researchers from different fields on both sides also provides a great complementary basis needed to reach the common goal.

Topic of Interest

The different topics of interest are, but not limited to:

- √ System Architecture
- √ System Design
- √ Computing Platforms
- √ Investigation of autonomic properties
- √ Case Studies and Test beds

Each participant willing to give a talk must send an abstract no longer than half page abstract to bobda@informatik.uni-kl.de. The abstract will be published on the WS-Homepage.
All participants will be invited to upload their slides on the WS-homepage one week before the starting of the school.

Participants:

Christophe Bobda, Kaiserslautern University
Karsten Berns, Kaiserslautern University
Norbert When, Kaiserslautern University
Klaus Schneider, Kaiserslautern University
Serge Weber, LIEN – Université Henri Poincaré, Nancy 1
Camel Tanougast, LIEN – Université Henri Poincaré, Nancy 1
Yves Berviller, LIEN – Université Henri Poincaré, Nancy 1
Hassan Rabah, LIEN – Université Henri Poincaré, Nancy 1
Philippe Poure, LIEN – Université Henri Poincaré, Nancy 1
Bernard Leplay, LICM - Université Paul Verlaine, Metz
Abbas Dandache, LICM - Université Paul Verlaine, Metz
Stanislas Piestrak, LICM - Université Paul Verlaine, Metz
Fabrice Monteiro, LICM – Université Paul Verlaine, Metz
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Organizers & **Sponsors :**

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UNIVERSITE FRANCO-ALLEMANDE

Université Henri Poincaré Nancy 1

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Technische Universität Kaiserslautern