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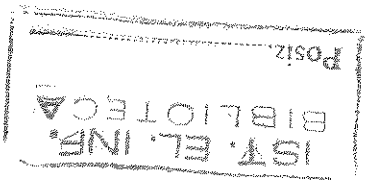

Editorial

Formal Methods have been advocated as a means for increasing the reliability of systems, especially those which are safety or business critical. In the last decade several theories have been developed which aim at coping with the problem of systems correctness by means of formal methodologies for the specification and design of systems and their verification. These theories have been extended in order to deal with time, and stochastic aspects of behaviours. More recently, international standards for safety strongly recommend the use of such methodologies, especially for critical systems. However, the use of formal methods in industry is still quite limited, as well as the transfer of such a technology from the academia.

In 1996, a Working Group on "Formal Methods for Industrial Critical Systems" – FMICS – was established within the European Research Consortium on Informatics and Mathematics – ERCIM (http://www.ercim.org/) with the aim fostering collaborative work within the European research community and of increasing co-operation with European industry.

In particular the FMICS main objectives are:

a. To bring together scientists mainly of, but not only of institutions with ERCIM, who are active in the field of formal methods and are willing to exchange their experience in the industrial usage of formal methods;
b. To coordinate efforts in the transfer of the formal methods technology and knowledge to industry; and
c. To promote research and development for the improvement of formal methods and tools with respect to their usage in the industry.

The above objectives are met mainly by means of workshops where the participation of industrial professionals is solicited as well as researchers mobility.

FMICS has organised three workshops so far. The First International Workshop on Formal Methods for Industrial Critical Systems took place in Oxford on March 19, 1996, as a satellite meeting of FME'96.

In this special issue of *Formal Aspects of Computing* a selection of the papers presented at the Second International Workshop on Formal Methods for Industrial Critical Systems that took place at Cesena on July 4–5, 1997, as a satellite meeting of ICALP'97 Conference, is published.

For this special issue the invited authors were asked to submit their papers. Subsequently, these submissions were reviewed by international referees. In this volume we are glad to present the revised version of these papers.

In the paper *Formal Modelling and Evaluation of an Adaptive Mechanism for Packetized Audio over the Internet*, M. Bernardo, R. Gorrieri and M. Roccetti

discuss a problem of high practical importance and present its compositional modelisation with the stochastically timed process algebra EMPA. Moreover the formal description is analysed via simulation by the EMPA software tool TwoTowers.

The papers *Formal Verification of a Computerized Railway Interlocking* by A. Borälv considers the application of formal methods to computerised railway interlocking. It reviews an existing formal method which is targeted at this area and describes an application of the method to a particular case study.

An industrial application of formal methods is described in *Formal Verification of a Railways Interlocking System using Model Checking* by A. Cimatti and colleagues. Here, model checking techniques have been used to verify a rather complex software. The specification language is PROMELA and the verification tool is SPIN.

In *Modelling and Verification of PREMO Synchronizable Objects*, G. Faconti and M. Massink describe a Basic LOTOS specification of the Synchronisable Object (SO), that is one of the central parts of the Presentation Environment for Multimedia Objects (PREMO) standard, under development with ISO/IEC. Some refined formal specification are presented and a number of properties, some of which were formulated in the standard, are shown which have been verified by means of model checking.

The paper, *The SH-Verification Tool: Abstraction-Based Verification of Co-operating Systems*, by P. Ochsenschlaeger et al. presents an abstraction methodology in the verification of concurrent systems and a tool which implements it. A notion of approximate satisfaction of a property is introduced, which captures a general notion of fairness.

The editors of this special issue wish to thank all the editorial board of *Formal Aspects of Computing* and in particular Prof. Egidio Astesiano who encouraged us to produce this special issue and helped us in all the intermediate phases. Special thanks is also due to Prof. Roberto Gorrieri who hosted the workshop giving us great support. We would also like to thank ERCIM, the Italian National Research Council institutes CNUCE and IEI and the CNR Research Area of Pisa, who all helped to set up FMICS and the workshop. Our special thanks also to all the participants who attended the workshop and to all the referees for their valuable contributions.

STEFANIA GNESI (gnesi@iei.pi.cnr.it)
DIEGO LATELLA (d.latella@cnuce.cnr.it)

Guest Editors