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Preface

Special issue on the Fifth International Workshop of the ERCIM Working Group on Formal Methods for Industrial Critical Systems, Berlin, April 3–4, 2000—selected papers

The purpose of this special issue of the International Journal “Science in Computer Programming” is to present a selection of papers from the Proceedings of the 5th ERCIM International Workshop on Formal Methods for Industrial Critical Systems (FMICS), which took place in Berlin in March 2000.

FMICS is the ERCIM Working Group on Formal Methods for Industrial Critical Systems. Launched in 1996 by Diego Latella and Stefania Gnesi (CNR Pisa), the FMICS working group is currently chaired by Hubert Garavel (INRIA Rhone-Alpes).

FMICS workshops are dedicated to interested researchers and practitioners at ERCIM sites, universities and industry active in the industrial application of formal methods. Among a variety of formal methods conferences and workshops FMICS is increasing its popularity. The idea of FMICS workshops is to attract people with industrial relevant topics, with internationally well-known invited speakers and with high-quality technical papers in combination with a discussion podium for the exchange of ideas in a working atmosphere.

The 5th FMICS was organized right after ETAPS’2000—the European Joint Conferences on Theory and Practice of Software in Berlin, hosted and organized at the GMD Research Institute for Open Communication Systems (FOKUS) in Berlin, Germany. After starting the FMICS workshop series 1996 in Oxford (UK) further workshops followed: 1997 in Cesena (I), 1998 in Amsterdam (NL) and 1999 in Trento (I).

Two invited talks were given, the first one by Gunter Karjoth, IBM Zurich (CH), addressing the value of formal methods for security properties such as confidentiality and authenticity and the second one by Holger Hermanns, University of Twente (NL), discussing performance and reliability model checking and construction exemplified for the Hubble space telescope.

The selected papers are not comprehensive for all facets of the state of the art in Formal Methods with respect to their use in—and suitability for—industry. Nevertheless, they give a picture of dedicated main streams of work.

Paulo J.F. Carreira and Miguel E.F. Costa in the paper *Automatically verifying an object-oriented specification of the Steam-Boiler system* present a framework on an automated verification of OBLOG specifications by using model-checking techniques.

This is obtained by developing a translation from OBLOG (an object-oriented language) to LOTOS (a process-algebraic specification language) and subsequently using the CADP verification toolset. The approach is illustrated by means of a case-study, the steam-boiler system.

The paper *Mode-Automata: a new domain-specific construct for the development of safe critical systems* by Florence Maranichi and Yann Rémond concerns the formal support for the programming of reactive systems, and the definition of programming constructs well-suited to the analysability of programs. In particular, it gives a motivation for and overview of mode-automata, their semantics and implementation. It presents a detailed case study, concerning the well-known production-cell simulator of FZI.

The paper *Efficient on-the-fly model-checking for regular alternation-free μ -calculus* by Radu Mateescu and Mihaela Sighireanu studies an efficient model-checking algorithm for an extension of the alternation-free μ -calculus with regular expressions allowing to characterize traces on a language of actions.

In the paper *A B model for ensuring soundness of a large subset of the Java Card virtual machine* by Antoine Requet an approach to the specification, refinement and proof of a Javacard Byte Code verifier is described. The application is significant and the project demonstrates the use of the B formal method in a real life development project.

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