ELSEVIER

Available online at www.sciencedirect.com

SCIENCE DIRECT®

Theoretical Computer Science 331 (2005) 249–250

Theoretical Computer Science

www.elsevier.com/locate/tcs

Preface

The first International Symposium on Formal Methods for Components and Objects (FMCO) was held in Leiden, The Netherlands, from November 5 to 8, 2002. The program consisted of invited presentations given by leading experts in the fields of Theoretical Computer Science and Software Engineering.

After the symposium, the speakers were invited to contribute to a combined special issue of the two sister journals *Theoretical Computer Science* and *Science of Computer Programming* that provides an in-depth overview of the state of the art of formal methods for components and objects.

This special issue focuses on the theoretical foundations of formal methods for component-based and object-oriented systems, whereas the other special issue focuses on the more pragmatic aspects of the application of formal methods of such systems.

The organization of FMCO has been carried out in the context of the NWO/DFG bilateral project Mobi-J and of the European IST project Omega (2001-33522). In particular, we acknowledge the NWO funding of Mobi-J, without which this symposium could not have been organized. We appreciate the cooperation with Willem-Paul de Roever and Susanne Graf in the organization of the FMCO symposium.

This special issue opens with an article by E. Abraham and her coauthors presenting assertional proof methods for a concurrent subset of the Java language. The concurrency model includes synchronous message passing, dynamic thread creation, shared-variable concurrency via instance variables, and coordination via reentrant synchronization monitors.

J. Hooman and J. van der Pol investigate the semantics of a distributed dataspace architecture in which data storage is based on time stamps. This semantics is shown to be fully abstract and it is used as a basis for compositional reasoning about the corresponding component architecture.

U. Montanari, G. Ferrari and E. Tuosto introduce finite-state verification techniques for the π-calculus. They provide a minimization algorithm for history-dependent automata derived from π-calculus components, and prove the convergence of the algorithm.

O. Nierstrasz and F. Achermann propose a calculus as formal foundation of components and their composition. This calculus is based on the asynchronous π-calculus, extended with explicit name-spaces, in order to reason about software components, and different styles of composition.

A. Pnueli and Y. Kesten present a compositional approach to the verification of CTL* prop-

0304-3975/$ - see front matter © 2004 Published by Elsevier B.V.
doi:10.1016/j.tcs.2004.09.018

erties over reactive systems by means of model-checking and deductive verification. Both methods are based on two decomposition principles. Furthermore, the deductive method is shown sound and relatively complete for verifying universal and existential basic assertional properties over reactive systems.

In his article E. Sekerinski illustrates the use of action-based object-oriented programs and studies their verification and refinement from specifications.

The final article is by M. Wirsing and D. Pattinson. They present a calculus for mobile systems which formalizes a separation of concerns between dynamic and topological aspects of distributed computations.

We gratefully acknowledge the referees for the high-quality of their reviews.

Leiden, June 2004

Frank de Boer
Marcello Bonsangue

CWI, Amsterdam
Netherlands
E-mail address: F.S.de.Boer@cwi.nl