

Lecture Notes in Computer Science

2154

Edited by G. Goos, J. Hartmanis, and J. van Leeuwen

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# CONCUR 2001 – Concurrency Theory

12th International Conference  
Aalborg, Denmark, August 20-25, 2001  
Proceedings



Springer

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## Cataloging-in-Publication Data applied for

### Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Concurrency theory : 12th international conference ; proceedings / CONCUR  
2001, Aalborg, Denmark, August 20 - 25, 2001. Kim G. Larsen ; Mogens  
Nielsen (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Hong Kong ; London ;  
Milan ; Paris ; Singapore ; Tokyo : Springer, 2001  
(Lecture notes in computer science ; Vol. 2154)  
ISBN 3-540-42497-0

CR Subject Classification (1998): F.3, F.1, D.3, D.1, C.2

ISSN 0302-9743

ISBN 3-540-42497-0 Springer-Verlag Berlin Heidelberg New York

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Springer-Verlag Berlin Heidelberg New York  
a member of BertelsmannSpringer Science+Business Media GmbH

<http://www.springer.de>

© Springer-Verlag Berlin Heidelberg 2001  
Printed in Germany

Typesetting: Camera-ready by author, data conversion by PTP-Berlin, Stefan Sossna  
Printed on acid-free paper      SPIN 10845533      06/3142      5 4 3 2 1 0

# Preface

This volume contains the proceedings of the 12th International Conference on Concurrency Theory (CONCUR 2001) hosted by Basic Research in Computer Science (BRICS) and the Department of Computer Science at Aalborg University, Denmark, August 20–25, 2001.

The purpose of the CONCUR conferences is to bring together researchers, developers, and students in order to advance the theory of concurrency, and promote its applications. Interest in this topic is continuously growing, as a consequence of the importance and ubiquity of concurrent systems and their applications, and of the scientific relevance of their foundations. The scope covers all areas of semantics, logics, and verification techniques for concurrent systems. Topics include concurrency related aspects of: models of computation and semantic domains, process algebras, Petri nets, event structures, real-time systems, hybrid systems, decidability, model-checking, verification techniques, refinement techniques, term and graph rewriting, distributed programming, logic constraint programming, object-oriented programming, typing systems and algorithms, case studies, and tools and environments for programming and verification.

The first two CONCUR conferences were held in Amsterdam (NL) in 1990 and 1991. The following ones in Stony Brook (USA), Hildesheim (D), Uppsala (S), Philadelphia (USA), Pisa (I), Warsaw (PL), Nice (F), Eindhoven (NL), and State College (USA). The proceedings have appeared in Springer LNCS, as volumes 458, 527, 630, 715, 836, 962, 1119, 1243, 1466, 1664, and 1877.

Of the 78 regular papers submitted this year, 32 were accepted for presentation and are included in the present volume. The conference also included talks by four invited speakers: Bengt Jonsson (Uppsala University, S), Robin Milner (University of Cambridge, GB), Shankar Sastry (University of California, Berkeley, USA), and Steve Schneider (Royal Holloway, University of London, GB). Additionally, there were two invited tutorials by Holger Hermanns and Joost-Pieter Katoen (Twente University, NL), and John Hatcliff (Kansas State University, USA). The conference had five satellite events:

- EXPRESS 2001 (Expressiveness in Concurrency), organized by Luca Aceto and Prakash Panangaden, held on 20 August 2001.
- GETCO 2001 (Geometric and Topological Methods in Concurrency), organized by Martin Raussen, held on 25 August 2001.
- RT-TOOLS (Workshop of Real-Time Tools), organized by Paul Pettersson, held on 20 August 2001.
- MTCS 2001 (Models for Time-Critical Systems), organized by Flavio Corradini and Walter Vogler, held on 25 August 2001.
- FATES 2001 (Formal Approaches to Testing of Software), organized by Jan Tretmans and Ed Brinksma, held on 25 August 2001.

We would like to thank all the Program Committee members and the sub-referees who assisted in their work. Also, the Local Organization Chair, Anna Ingólfssdóttir, and the other members of the Local Organization, Luca Aceto and Arne Skou, and further members of BRICS deserve our gratitude for their contributions throughout the preparations. Thanks to the Workshop Chair, Hans Hüttel, and the workshop organizers. We would also like to thank the invited speakers and invited tutorial speakers, the authors of submitted papers, and all the participants of the conference. Special thanks to Brian Nielsen for installing and managing the START Conference system.

We gratefully acknowledge support from Det Obelske Familiefond, Thomas B. Thrige Foundation, Vaughan Pratt, Mindpass, the Department of Computer Science at Aalborg University, BRICS, and the City of Aalborg.

June 2001

Kim Guldstrand Larsen and Mogens Nielsen

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