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Theorem Provers in Circuit Design

Theory, Practice and Experience

Second International Conference, TPCD '94
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Proceedings

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Preface

This volume contains the final revised proceedings of the Second International Conference on Theorem Provers in Circuit Design, jointly organized by FZI (Forschungszentrum Informatik), Karlsruhe, and the University of Karlsruhe (Universität Karlsruhe, Institut für Rechnerentwurf und Fehlertoleranz), in cooperation with IFIP (International Federation of Information Processing) Working Group 10.2. The workshop took place in the Treff Hotel, Bad Herrenalb, Germany from 26 to 28 September 1994.

The conference was a sequel to the one held at Nijmegen in June 1992 and provided a forum for discussing the role of theorem provers in the design of digital systems. The topics of interest included original research as well as case studies and other practical experiments with new or established theorem proving tools, including tautology and model checkers.

The field of formal methods in hardware abounds with various kinds of formalisms, each of which have their advantages and disadvantages. Two of the popular theorem provers, with different underlying formalisms, were presented as tutorial talks.

Two invited papers highlighted the use of formal methods in circuit design from an academic and an industrial viewpoint. They were given by Tom Melham (*Inductive Reasoning about Circuit Design*) and Pasupati Subrahmanyam (*Compositionality, Hierarchical Verification and the Principle of Transparency*).

An interesting panel discussion on the *Use of Formal Methods in Industry* was conducted with the following participants: Massimo Bombana, Holger Busch, Alberto Camilleri, Pasupati Subrahmanyam, and John van Tassel.

All submitted research papers were reviewed by at least three independent reviewers, who are all experts in the field. The emphasis of the conference was laid on an in-depth presentation of the approaches instead of accepting many papers, hence only 50% of the submitted papers were accepted as full papers, each of which was given 40 minutes of presentation time. Four papers were acknowledged for their interesting ideas and accepted as short papers.

The research papers were complemented by the demonstration of verification systems — *Fancy, MEPHISTO, PVS, Prevail,* and *Synchronized Transitions*.

At this conference also a set of benchmark circuits for hardware-verification was presented. These circuits are the basis for an international standardization effort of IFIP WG10.2 in order to provide a common basis for evaluating and comparing different approaches of hardware verification and formal synthesis.

We thank all people who actively supported us in organizing this conference, all members of the programme committee, and especially Hilke Kloss for solving many organizational details and Frank Imhoff and Dirk Eisenbiegler for their work in setting up the hardware for the system demonstrations. We are also grateful to Michael Berthold for his help in publishing these proceedings.

January 1995

Ramayya Kumar
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