Lecture Notes in Computer Science

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TAPSOFT '91

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Colloquium on Trees in Algebra and
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Preface

TAPSOFT '91 is the Fourth International Joint Conference on Theory and Practice of Software Development.

It is being held 8-12 April 1991 at the Corn Exchange, Brighton, UK, and has been organized by the Department of Computing, Imperial College, London.

TAPSOFT '91 consists of four parts:

1. Advances in Distributed Computing (ADC)

This series of talks by distinguished invited speakers surveys current developments in Distributed Computing, including the integration of different paradigms for concurrency, algebraic, logical and operational foundations, and applications to software engineering and formal methods.
There will also be a panel discussion on the impact of theory on practice in Software Engineering.

Invited Speakers:

J. de Bakker (Amsterdam)
U. Montanari (Pisa)
R. Milner (Edinburgh)
G. Berry (Sophia Antipolis)
J. Halpern (Almaden)
E. Shapiro (Rehovot)
J. Sifakis (Grenoble)
H. Weber (Dortmund)

Panel: The impact of theory on practice: past, present and future.
Chairman: G. Kahn (Sophia Antipolis)

2. Colloquium on Trees in Algebra and Programming (CAAP)

This is the 16th of these colloquia. The preceding colloquia were held in France and Italy, until 1985 in Berlin, where for the first time CAAP was integrated into TAPSOFT. This was repeated in 1987 in Pisa, and in 1989 in Barcelona.

Originally this colloquium series was devoted to the algebraic and combinatorial properties of trees, and their role in various fields of Computer Science. Nowadays trees are as well established in Computer Science as strings – but many other discrete structures, for example graphs, are also being used. In keeping with CAAP's tradition and taking into account the evolution of Computer Science, CAAP '91 focuses on the following topics.

* Logical, algebraic and combinatorial properties of discrete structures (strings, trees, graphs, etc.), including the theory of formal languages considered in the broad sense as that of sets of discrete structures and the theory of rewriting systems over these objects.

* Application of discrete structures in Computer Science: syntax and semantics of programming language, operational semantics, logic programming, algorithms and data structures, complexity of algorithms and implementation aspects, proof techniques for nonnumerical algorithms, formal specifications, visualization of trees and graphs, etc.

Programme Committee for CAAP

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(* indicates those attending the Programme Committee meeting)

3. Colloquium on Combining Paradigms for Software Development (CCPSD)

A major feature of research in software engineering over the past few years has been the trend towards unification and synthesis combining theory and practice, and merging hitherto diverse approaches. We invite submissions which address some aspects of this tendency. Examples include:
* The attempt to combine various programming paradigms, particularly the functional, logic, object-oriented and concurrent process paradigms.
* Types, objects and databases using ideas and techniques from type checking and type inference as developed in programming language semantics.
* Semantics based techniques for the compile time analysis of programs, combining theoretical work on semantics with practical issues in language implementation.
* Specification of systems from multiple points of view, perhaps combining different formalisms, to provide a more effective basis for software development.
* Applying process analysis and description techniques to study software development itself as a formal object of enquiry.

Programme Committee for CCPSD

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H. Weber* (Dortmund)

(* indicates those attending the Programme Committee meeting)

4. Tutorials

Three tutorials are being offered, to run in parallel with CAAP and CCPSD. These are as follows:
A. Constraint logic programming, given by G. Smolka (Saarland)
B. Reasoning about concurrent systems using the Edinburgh concurrency work bench, given by G. Bruns (Edinburgh)
C. Abstract interpretation, given by C. Hankin (London)

The TAPSOFT '91 conference proceedings are published in two volumes. The first volume contains the papers from CAAP. The second volume contains the papers from the ADC and CCPSD.

We would like to thank all the Programme Committee members for their efforts in refereeing the submitted papers.

We would also like to express our gratitude to the members of the Organising Committee and particularly Ian Phillips, Kim Harrison, Suzanne Daniels and Anne McLoughlin for their assistance in the organisation of the conference; and PPL Conference Services for their efficient and friendly work on our behalf.

London, March 1991

S. Abramsky
T.S.E. Maibaum

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ADC Advances in Distributed Computing

CCPSD Colloquium on Combining Paradigms for Software Development