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TAPSOFT '97: Theory and Practice of Software Development

7th International Joint Conference CAAP/FASE
Lille, France, April 14-18, 1997
Proceedings

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Preface

TAPSOFT '97 was the Seventh International Joint Conference on the Theory and Practice of Software Development. It took place at the University of Lille I, France, 14-18 April, 1997.

The TAPSOFT series was started in Berlin in 1985, on the initiative of Hartmut Ehrig, Bernard Mahr, and Christiane Floyd (among others). Since then TAPSOFT has been held biennially, in Pisa (1987), Barcelona (1989), Brighton (1991), Orsay (1993), Aarhus (1995), and Lille (1997).

TAPSOFT is traditionally composed of:
- **Invited lectures** by leading researchers;
- **CAAP:** Colloquium on Trees in Algebra and Programming - covering a wide range of topics in theoretical computer science;
- **FASE:** Colloquium on Formal Approaches in Software Engineering - with the emphasis on practical applicability;
- In recognition of the importance of support tools for practical use of formal approaches, TAPSOFT '97 also included two plenary sessions during which **TOOLS** were demonstrated.

TAPSOFT '97 was the last one, and CAAP '97 is the 22nd and last one too. CAAP was born in Lille in 1976, where it stayed for five years. From 1982 to 1996, it moved across Europe: Genova, Lille (again), L'Aquila, Bordeaux, Berlin, Nice, Pisa, Nancy, Barcelona, Copenhagen, Brighton, Rennes, Orsay, Edinburgh, Aarhus, and Linköping.

Life and science evolve, and conferences must evolve too. This is the reason why TAPSOFT and CAAP/ESOP/CC will now give way to a new series of meetings: The European Joint Conferences on Theory and Practice of Software (ETAPS). Starting in Lisbon, Portugal, 1998, this new annual meeting, covering a wide range of topics in software sciences, will take place in Europe each spring. ETAPS will be a loose and open confederation of existing conferences, such as FASE, and new conferences, such as FoSSaCS (the successor of CAAP), and other events.

TAPSOFT Steering Committee:
A. Arnold, P. Degano, H. Ehrig, M.-C. Gaudel, T. Maibaum, U. Montanari, P.D. Mosses, M. Nivat, F. Orejas.

Invited Lectures

Special Panel Discussion for the final TAPSOFT and CAAP, before the first ETAPS :

Theoretical Computer Science and Software Sciences: the past, the present, and the future. Invited panelists are Corrado Böhm, a pioneer of this area, Hartmut Ehrig, initiator of TAPSOFT, M. Nivat, initiator of CAAP, and Don Sannella, chairman of ETAPS Steering Committee. Corrado Böhm states that Computer Science is just beginning now. Maurice Nivat agrees with this claim, and points out the importance of algorithmics.

Hartmut Ehrig and Bernd Mahr summarize the evolution of the domain under four trends, and Don Sannella explains why maintenance of a link between theory and practice is a key to the future health of both.

Invited Speakers

Egidio Astesiano and Gianna Reggio illustrate the view that formal methods are useful tools within the context of an overall engineering process. The case of the use of formal specification techniques is developed, with the help of some comparative analysis of concrete examples. They outline, as an attempt, a possible decomposition of that activity into components and facets. Adel Bouhoula, Jean-Pierre Jouannaud, and José Meseguer describe part of a long-term effort to increase expressiveness of algebraic specification languages while at the same time having a simple semantic basis on which efficient execution by rewriting and powerful theorem-proving tools can be based.

Tom Maibaum presents a retrospective on the work of his group, and outlines the basic principles of a general theory of specification. Peter D. Mosses points out that a common framework for algebraic specification and development of software is needed. This framework must provide a family of specification languages at different levels: a central, reasonably expressive language, called CASL, is proposed.

Wolfgang Thomas reviews recent results which aim at generalizing finite automata theory from words and trees to labelled partial orders, with an emphasis on logical aspects. Pictures (two-dimensional words) are considered as an important type of labelled partial order. Frits Vaandrager presents a generalization of the classic theory of testing for (finite state) Mealy machines to a setting of timed automata in the style of Alur and Dill.

CAAP '97
Colloquium on Trees in Algebra and Programming

Programme Committee:

S. Abramsky (UK)
A. Arnold (France)
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M. Nielsen (Denmark)
M. Nivat (France)
J.-F. Perrot (France)
J.-C. Raoult (France)
S. Tison (France).

The Programme Committee was composed of the chairpersons of all the preceding CAAPs. For the final CAAP, we had one of the greatest number of submissions. Out of 77 submitted papers, 30 papers were selected. These have been grouped into sessions on rewriting and automata, automata and time, termination, bisimulations and Pi-calculus, set constraints, complexity, unification and matching, and types.

FASE '97
Colloquium on Formal Approaches in Software Engineering

Programme Committee:

E. Astesiano (Italy)
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P.D. Mosses (Denmark)
F. Orejas (Spain)
D. Sannella (UK)
A. Finkel (France)
B. Steffen (Germany)
M. Wirsing (Germany)

The aim of this colloquium was to provide a forum for the presentation, comparison, and discussion of different formal approaches to problems of software specification, development, and verification. Out of 79 submitted papers, the Programme Committee selected 23 for presentation at the conference. These are grouped into sessions on specifications, verification, types and their applications, real-time and distributed systems, semantics, static analysis, refinement, and applications of formal methods to software engineering.

TOOLS

The two plenary TOOLS sessions at TAPSOFT '97 provided demonstrations of eight relevant systems altogether. Moreover, there were facilities for further demonstrations of these and other systems in the breaks and during the parallel sessions. It was hoped that this would give the TAPSOFT participants a useful opportunity to assess some of the main tools that are currently available. Plenary TOOLS sessions were first included in the TAPSOFT programme for TAPSOFT '95 and this was felt to be a very useful complement to the CAAP and FASE presentations. The demonstrations are documented by 4-pages summaries, printed at the back of these proceedings.

Acknowledgments

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The CAAP and FASE Programme Committee members, who proved that it is possible to hold good electronic meetings.
Prof. Michel Beaudouin-Lafon, who provided invaluable help for the organization of the FASE electronic PC meeting.
The referees, who provided reports on the submitted papers.
Alfred Hofmann at Springer-Verlag, who kindly agreed to publish the proceedings in the Lecture Notes in Computer Science series.
LIFL (Laboratoire d'Informatique Fondamentale de Lille), which hosted TAPSOFT '97.

The following organizations sponsored TAPSOFT '97:
- The European Association for Theoretical Computer Science
- The HCM European Community project CONSOLE
- Le Ministère de l'Education Nationale, de l'Enseignement Supérieur et de la Recherche
- Le Centre National de la Recherche Scientifique
- L'Ecole Nouvelle d'Ingénieurs en Communication
- La Région Nord/Pas-de-Calais
- Le Département du Nord
- La Ville de Lille
- Le Laboratoire Spécification et Vérification, URA 2236 du CNRS, Ecole Normale Supérieure de Cachan
- Le LIFL, URA 369 du CNRS, Université de Lille I.

TAPSOFT '97 Organizing Committee: A.-C. Caron (chair), M. Tommasi (publicity and demos); Y. André, F. Bossut, R. Gilleron, S. Tison.

Lille, January 1997

M. Bidoit and M. Dauchet

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