

## Foreword

This volume contains a selection of papers presented at the International Conference on Analytic Tableaux and Related Methods (TABLEAUX'99) held on June 7-11, 1999 at the Inn at Saratoga, Saratoga Springs, NY, USA. This conference was the continuation of international meetings on Theorem Proving with Analytic Tableaux and Related Methods held in Lautenbach near Karlsruhe (1992), Marseille (1993), Abingdon near Oxford (1994), St. Goar near Koblenz (1995), Terrasini near Palermo (1996), Pont-à-Mousson near Nancy (1997), and Oisterwijk near Tilburg (1998). TABLEAUX'99 marks the first time the conference has been held in North America.

Tableau and related methods have been found to be convenient and effective for automating deduction in various non-standard logics as well as in classical logic. Examples taken from this meeting alone include temporal, description, tense, quantum, modal, projective, hybrid, intuitionistic, and linear logics. Areas of application include verification of software and computer systems, deductive databases, knowledge representation and its required inference engines, and system diagnosis. The conference brought together researchers interested in all aspects – theoretical foundations, implementation techniques, systems development and applications – of the mechanization of reasoning with tableaux and related methods.

The members of the program committee worked diligently in selecting the presented papers. Each research paper was given a formal evaluation by three referees – to whom we are indeed grateful. From the 41 submissions received, 18 original *research papers* and 3 original *system descriptions* were chosen by the program committee for presentation at the conference and for inclusion in these proceedings, together with the invited lectures. Also included are the abstracts of 2 *tutorials*, a summary of the non classical systems comparison conducted for TABLEAUX'99, descriptions of the comparison entries, and the titles and authors of *position papers*, which were also presented at the conference.

**Acknowledgements** First, I would like to thank the local arrangements chair, Joan Nellhaus, who helped with virtually all aspects of organizing the conference. I also thank Fabio Massacci, who organized the comparison. Ron Goebel put much time and effort into installing the web software that facilitated secure discussions amongst program committee members.

I also thank the authors of all submissions, the speakers, the tutorial organizers, the comparison entrants, program committee members, and, last but not least, the sponsors, who made it possible to organize this conference in Saratoga Springs, NY.

March 1999

Neil V. Murray

## Previous Tableaux Workshops/Conferences

1992	Lautenbach, Germany	1993	Marseille, France
1994	Abingdon, England	1995	St. Goar, Germany
1996	Terrasini, Italy	1997	Pont-à-Mousson, France
1998	Oisterwijk, The Netherlands		

## Invited speakers

Randal Bryant	Carnegie Mellon Univ., Pittsburgh, U.S.A.
David S. Warren	Univ. at Stony Brook – SUNY, Stony Brook, U.S.A.

## Program Chair

Neil V. Murray  
University at Albany - SUNY

## Local Arrangements

Joan Nellhaus  
Inst. for Programming & Logics (SUNY)

## Program Committee

P. Baumgartner	University of Koblenz, Germany
B. Beckert	University of Karlsruhe, Germany
K. Broda	Imperial College, London, U.K.
R. Dyckhoff	St. Andrews University, U.K.
A. Felty	Bell Labs, U.S.A.
C. Fermueller	TU Wien, Austria
M. Fitting	CUNY, New York City, U.S.A.
U. Furbach	University of Koblenz, Germany
D. Galmiche	LORIA, Nancy, France
R. Goré	Australian National University, Australia
J. Goubault-Larrecq	GIE Dyade, France
R. Hähnle	University of Karlsruhe, Germany
J. Hodas	Harvey Mudd College, California, U.S.A.
C. Kreitz	Cornell University, U.S.A.
R. Letz	Technical University of Munich, Germany
D. Miller	Pennsylvania State University, U.S.A.
U. Moscato	University of Milan, Italy
N. Murray	University at Albany - SUNY, U.S.A.
N. Olivetti	Torino University, Italy
J. Pitt	Imperial College, London, U.K.
E. Rosenthal	University of New Haven, U.S.A.
P. Schmitt	University of Karlsruhe, Germany
H. de Swart	Tilburg University, The Netherlands

## Referees

Each submitted paper was refereed by three members of the program committee. In some cases, they consulted specialists who were not on the committee. We gratefully mention their names.

Wolfgang Ahrendt	D. Larchey-Wendling
Alessandro Avellone	Alexander Leitsch
Matthias Baaz	Donald Loveland
Matteo Baldoni	James Lu
Felice Cardone	Ornaghi Mario
A. Cichon	Fabio Massacci
Ingo Dahn	Georg Moser
C. Faggian	Christian Pape
Mauro Ferrari	Uwe Petermann
Camillo Fiorentini	Torsten Schaub
Andreas Goerdt	Gernot Stenz
Guido Governatori	Mark Stickel
M. Kuehn	L. Vigneron

## Sponsors

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## Position Papers

The regular conference program included the presentation of nine (of eleven accepted) position papers. Informal proceedings containing these papers appeared as the internal scientific report “Position Papers, TABLEAUX’99”, TR 99-1, Department of Computer Science, University at Albany - SUNY, Albany, NY, U.S.A.

Sequent Decomposition: A Sequent Calculus as Efficient as Resolution.

*Noriko H. Arai, Shinji Inoue, and Ryuji Masukawa*

Tactics for Translation of Tableau in Natural Deduction.

*Alessandro Avellone, Marco Benini, and Ugo Moscato*

Depth-First Proof Search without Backtracking for Free Variable Semantic Tableaux.

*Bernhard Beckert*

Gentzen-Like Methods in Quantum Logic.

*Uwe Egly and Hans Tompits*

Unification-Based Proof Method for Modal Logic with Well-Founded Frames.

*Shigeki Hagihara and Naoki Yonezaki*

Model Generation for Natural-Language Semantic Analysis.

*Karsten Konrad*

A Proof of Completeness for Non-Horn Magic Sets and Its Application to Proof Condensation.

*Miyuki Koshimura and Ryuzo Hasegawa*

An Application of Labelled Tableaux to Parsing.

*Karl-Michael Schneider*

COLOSSEUM An Automated Theorem Prover for Intuitionistic Predicate Logic Based on Dialogue Games.

*Claus Zinn*

Goal Lift-Up: A Technique for Improving Proof Search in Connection Tableau Calculi.

*Dirk Fuchs and Marc Fuchs*

Simultaneous Sorted Unification for Free Variable Tableaux: An Elegant Calculus.

*Pedro J. Martín de la Calle and Antonio Gavilanes Franco*