

# Table of Contents

## Keynote Papers

Algorithms, Games, and the Internet .....	1
<i>C.H. Papadimitriou</i>	
Automata, Circuits, and Hybrids: Facets of Continuous Time .....	4
<i>B.A. Trakhtenbrot</i>	

## Invited Papers

Languages, Rewriting Systems, and Verification of Infinite-State Systems ...	24
<i>A. Bouajjani</i>	
Integrating Semantics for Object-Oriented System Models .....	40
<i>M. Große-Rhode</i>	
Modelling with Partial Orders - Why and Why Not?.....	61
<i>M. Nielsen</i>	
Theoretical Aspects of Evolutionary Algorithms .....	64
<i>I. Wegener</i>	

## Algebraic and Circuit Complexity

Improvements of the Alder-Strassen Bound: Algebras with Nonzero Radical .....	79
<i>M. Bläser</i>	
On Generating All Minimal Integer Solutions for a Monotone System of Linear Inequalities .....	92
<i>E. Boros, K. Elbassioni, V. Gurvich, L. Khachiyan, K. Makino</i>	
Division Is in Uniform $TC^0$ .....	104
<i>W. Hesse</i>	

## Algorithm Analysis

A Framework for Index Bulk Loading and Dynamization .....	115
<i>P.K. Agarwal, L. Arge, O. Procopiuc, J.S. Vitter</i>	

A Characterization of Temporal Locality and Its Portability across Memory Hierarchies .....	128
<i>G. Bilardi, E. Peserico</i>	
The Complexity of Constructing Evolutionary Trees Using Experiments ...	140
<i>G.S. Brodal, R. Fagerberg, C.N.S. Pedersen, A. Östlin</i>	
Hidden Pattern Statistics.....	152
<i>P. Flajolet, Y. Guivarc'h, W. Szpankowski, B. Vallée</i>	
Combinatorics and Algorithms on Low-Discrepancy Roundings of a Real Sequence.....	166
<i>K. Sadakane, N. Takki-Chebihi, T. Tokuyama</i>	
All-Pairs Shortest Paths Computation in the BSP Model .....	178
<i>A. Tiskin</i>	

## Approximation and Optimization

Approximating the Minimum Spanning Tree Weight in Sublinear Time ...	190
<i>B. Chazelle, R. Rubinfeld, L. Trevisan</i>	
Approximation Hardness of TSP with Bounded Metrics .....	201
<i>L. Engebretsen, M. Karpinski</i>	
The $RPR^2$ Rounding Technique for Semidefinite Programs .....	213
<i>U. Feige, M. Langberg</i>	
Approximation Algorithms for Partial Covering Problems.....	225
<i>R. Gandhi, S. Khuller, A. Srinivasan</i>	
On the Online Bin Packing Problem.....	237
<i>S.S. Seiden</i>	
Quick $k$ -Median, $k$ -Center, and Facility Location for Sparse Graphs.....	249
<i>M. Thorup</i>	

## Complexity

Parameterized Complexity: Exponential Speed-Up for Planar Graph Problems.....	261
<i>J. Alber, H. Fernau, R. Niedermeier</i>	

Subexponential Parameterized Algorithms Collapse the W-Hierarchy . . . . .	273
<i>L. Cai, D. Juedes</i>	
Improved Lower Bounds on the Randomized Complexity of Graph Properties . . . . .	285
<i>A. Chakrabarti, S. Khot</i>	
New Imperfect Random Source with Applications to Coin-Flipping . . . . .	297
<i>Y. Dodis</i>	
Recognizing More Unsatisfiable Random 3-SAT Instances Efficiently . . . . .	310
<i>J. Friedman, A. Goerdt</i>	
Weisfeiler-Lehman Refinement Requires at Least a Linear Number of Iterations . . . . .	322
<i>M. Fürer</i>	
On Interactive Proofs with a Laconic Prover . . . . .	334
<i>O. Goldreich, S. Vadhan, A. Wigderson</i>	
Quantum Complexities of Ordered Searching, Sorting, and Element Distinctness . . . . .	346
<i>P. Høyer, J. Neerbek, Y. Shi</i>	
Lower Bounds in the Quantum Cell Probe Model . . . . .	358
<i>P. Sen, S. Venkatesh</i>	
 <b>Concurrency</b>	
Axiomatizations for Probabilistic Bisimulation . . . . .	370
<i>E. Bandini, R. Segala</i>	
Noninterference for Concurrent Programs . . . . .	382
<i>G. Boudol, I. Castellani</i>	
Distributed Controller Synthesis for Local Specifications . . . . .	396
<i>P. Madhusudan, P.S. Thiagarajan</i>	
A Distributed Abstract Machine for Safe Ambients . . . . .	408
<i>D. Sangiorgi, A. Valente</i>	
Towards Quantitative Verification of Probabilistic Transition Systems . . . . .	421
<i>F. van Breugel, J. Worrell</i>	

## Efficient Datastructures

Efficient Generation of Plane Triangulations without Repetitions . . . . .	433
<i>Z. Li, S-i. Nakano</i>	
The Longest Common Subsequence Problem for Sequences with Nested Arc Annotations . . . . .	444
<i>G.-H. Lin, Z.-Z. Chen, T. Jiang, J. Wen</i>	
Visibility-Based Pursuit-Evasion in a Polygonal Region by a Searcher . . . . .	456
<i>S.-M. Park, J.-H. Lee, K.-Y. Chwa</i>	
A New Method for Balancing Binary Search Trees . . . . .	469
<i>S. Roura</i>	

## Graph Algorithms

Permutation Editing and Matching via Embeddings . . . . .	481
<i>G. Cormode, S. Muthukrishnan, S.C. Sahinalp</i>	
Testing Hypergraph Coloring . . . . .	493
<i>A. Czumaj, C. Sohler</i>	
Total Colorings of Degenerated Graphs . . . . .	506
<i>S. Isobe, X. Zhou, T. Nishizeki</i>	
Decidable Properties of Graphs of All-Optical Networks . . . . .	518
<i>L. Margara, J. Simon</i>	
Majority Consensus and the Local Majority Rule . . . . .	530
<i>N.H. Mustafa, A. Pekeč</i>	

## Language Theory, Codes and Automata

Solvability of Equations in Free Partially Commutative Groups Is Decidable . . . . .	543
<i>V. Diekert, A. Muscholl</i>	
Rational Transformations of Formal Power Series . . . . .	555
<i>M. Droste, G.-Q. Zhang</i>	
Combinatorics of Three-Interval Exchanges . . . . .	567
<i>S. Ferenczi, C. Holton, L.Q. Zamboni</i>	

Decision Questions Concerning Semilinearity, Morphisms, and Commutation of Languages.....	579
<i>T. Harju, O. Ibarra, J. Karhumäki, A. Salomaa</i>	
The Star Problem in Trace Monoids: Reductions Beyond C4.....	591
<i>D. Kirsten</i>	
The Trace Coding Problem Is Undecidable.....	603
<i>M. Kunc</i>	
Combinatorics of Periods in Strings.....	615
<i>E. Rivals, S. Rahmann</i>	
Minimal Tail-Biting Trellises for Certain Cyclic Block Codes Are Easy to Construct.....	627
<i>P. Shankar, P.N.A. Kumar, H. Singh, B.S. Rajan</i>	
<b>Model Checking and Protocol Analysis</b>	
Effective Lossy Queue Languages.....	639
<i>P.A. Abdulla, L. Boasson, A. Bouajjani</i>	
Model Checking of Unrestricted Hierarchical State Machines.....	652
<i>M. Benedikt, P. Godefroid, T. Reps</i>	
Symbolic Trace Analysis of Cryptographic Protocols.....	667
<i>M. Boreale</i>	
Tree Automata with One Memory, Set Constraints, and Ping-Pong Protocols.....	682
<i>H. Comon, V. Cortier, J. Mitchell</i>	
Fair Simulation Relations, Parity Games, and State Space Reduction for Büchi Automata.....	694
<i>K. Etessami, T. Wilke, R.A. Schuller</i>	
Hypergraphs in Model Checking: Acyclicity and Hypertree-Width versus Clique-Width.....	708
<i>G. Gottlob, R. Pichler</i>	
From Finite State Communication Protocols to High-Level Message Sequence Charts.....	720
<i>A. Muscholl, D. Peled</i>	

## Networks and Routing

Fractional Path Coloring with Applications to WDM Networks . . . . .	732
<i>I. Caragiannis, A. Ferreira, C. Kaklamanis, S. Pérennes, H. Rivano</i>	
Performance Aspects of Distributed Caches Using TTL-Based Consistency . . . . .	744
<i>E. Cohen, E. Halperin, H. Kaplan</i>	
Routing in Trees . . . . .	757
<i>P. Frainaud, C. Gavoille</i>	
Online Packet Routing on Linear Arrays and Rings . . . . .	773
<i>J.T. Havill</i>	
Faster Gossiping on Butterflies . . . . .	785
<i>J.F. Sibeyn</i>	

## Reasoning and Verification

Realizability and Verification of MSC Graphs . . . . .	797
<i>R. Alur, K. Etessami, M. Yannakakis</i>	
Reasoning about Sequential and Branching Behaviours of Message Sequence Graphs . . . . .	809
<i>P. Madhusudan</i>	
A Set-Theoretic Framework for Assume-Guarantee Reasoning . . . . .	821
<i>P. Maier</i>	
Foundations for Circular Compositional Reasoning . . . . .	835
<i>M. Viswanathan, R. Viswanathan</i>	

## Scheduling

A PTAS for Minimizing Weighted Completion Time on Uniformly Related Machines . . . . .	848
<i>C. Chekuri, S. Khanna</i>	
The Buffer Minimization Problem for Multiprocessor Scheduling with Conflicts . . . . .	862
<i>M. Chrobak, J. Csirik, C. Imreh, J. Noga, J. Sgall, G.J. Woeginger</i>	

On Minimizing Average Weighted Completion Time of Multiprocessor Tasks with Release Dates.....	875
<i>A.V. Fishkin, K. Jansen, L. Porkolab</i>	

On the Approximability of Average Completion Time Scheduling under Precedence Constraints .....	887
<i>G.J. Woeginger</i>	

## Secure Computation

Optimistic Asynchronous Multi-party Contract Signing with Reduced Number of Rounds.....	898
<i>B. Baum-Waidner</i>	

Information-Theoretic Private Information Retrieval: A Unified Construction.....	912
<i>A. Beimel, Y. Ishai</i>	

Secure Multiparty Computation of Approximations.....	927
<i>J. Feigenbaum, Y. Ishai, T. Malkin, K. Nissim, M.J. Strauss, R.N. Wright</i>	

Secure Games with Polynomial Expressions.....	939
<i>A. Kiayias, M. Yung</i>	

## Specification and Deduction

On the Completeness of Arbitrary Selection Strategies for Paramodulation.....	951
<i>M. Bofill, G. Godoy</i>	

An Axiomatic Approach to Metareasoning on Nominal Algebras in HOAS.....	963
<i>F. Honsell, M. Miculan, I. Scagnetto</i>	

Knuth-Bendix Constraint Solving Is NP-Complete.....	979
<i>K. Korovin, A. Voronkov</i>	

Amalgamation in CASL via Enriched Signatures .....	993
<i>L. Schröder, T. Mossakowski, A. Tarlecki</i>	

## Structural Complexity

Lower Bounds for the Weak Pigeonhole Principle Beyond Resolution . . . . .	1005
<i>A. Atserias, M.L. Bonet, J.L. Esteban</i>	
Time and Space Bounds for Reversible Simulation . . . . .	1017
<i>H. Buhrman, J. Tromp, P. Vítányi</i>	
Finite-State Dimension . . . . .	1028
<i>J.J. Dai, J.I. Lathrop, J.H. Lutz, E. Mayordomo</i>	
The Complexity of Computing the Size of an Interval . . . . .	1040
<i>L.A. Hemaspaandra, S. Kosub, K.W. Wagner</i>	
Communication Gap for Finite Memory Devices . . . . .	1052
<i>T. Jurdziński, M. Kutylowski</i>	
Separating Quantum and Classical Learning . . . . .	1065
<i>R.A. Servedio</i>	
<b>Author Index</b> . . . . .	1081



<http://www.springer.com/978-3-540-42287-7>

Automata, Languages and Programming  
28th International Colloquium, ICALP 2001 Crete,  
Greece, July 8-12, 2001 Proceedings  
Orejas, F.; Spirakis, P.G.; Leeuwen, J. van (Eds.)  
2001, XIV, 1086 p., Softcover  
ISBN: 978-3-540-42287-7