

Tetsuo Asano Yoshihide Igarashi  
Hiroshi Nagamochi Satoru Miyano  
Subhash Suri (Eds.)

# Algorithms and Computation

7th International Symposium, ISAAC '96  
Osaka, Japan, December 16-18, 1996  
Proceedings



Springer

# Contents

## Session 1: Invited Presentation

*Applications of a Numbering Scheme for Polygonal Obstacles in the Plane*

Mikhail J. Atallah and Danny Z. Chen ..... 1

## Session 2: Invited Presentation

*Multicast Communication in High Speed Networks*

Jonathan S. Turner ..... 25

## Session 3a

*Incremental Convex Hull Algorithms Are Not Output Sensitive*

David Bremner ..... 26

*Separating and Shattering Long Line Segments*

Alon Efrat and Otfried Schwarzkopf ..... 36

*Optimal Line Bipartitions of Point Sets*

Olivier Devillers and Matthew J. Katz ..... 45

*Interval Finding and Its Application to Data Mining*

Takeshi Fukuda, Yasuhiko Morimoto, Shinichi Morishita and Takeshi Tokuyama ... 55

## Session 3b

*On the Approximability of the Steiner Tree Problem in Phylogeny*

David Fernández-Baca and Jens Lagergren ..... 65

*Approximation and Special Cases of Common Subtrees and Editing Distance*

Magnús M. Halldórsson and Keisuke Tanaka ..... 75

*Two-Dimensional Dynamic Dictionary Matching*

Ying Choi and Tak Wah Lam ..... 85

*Discovering Unbounded Unions of Regular Pattern Languages from Positive Examples*

Alvis Brāzma, Esko Ukkonen and Jaak Vilo ..... 95

## Session 4a

*Extremal Problems for Geometric Hypergraphs*

Tamal K. Dey and János Pach ..... 105

*Computing Fair and Bottleneck Matchings in Geometric Graphs*

Alon Efrat and Matthew J. Katz ..... 115

*Computing the Maximum Overlap of Two Convex Polygons Under Translations*

Mark de Berg, Olivier Devillers, Marc van Kreveld, Otfried Schwarzkopf and Monique Teillaud .....	126
--	-----

**Session 4b**

*OBDDs of a Monotone Function and of Its Prime Implicants*

Kazuyoshi Hayase and Hiroshi Imai .....	136
---	-----

*Algorithms for Maximum Matching and Minimum Fill-in on Chordal Bipartite Graphs*

Maw-Shang Chang .....	146
-----------------------	-----

*Graph Searching on Chordal Graphs*

Sheng-Lung Peng, Ming-Tat Ko, Chin-Wen Ho, Tsan-sheng Hsu and Chuan-Yi Tang	156
---	-----

**Session 5a**

*An Algorithm for Enumerating All Directed Spanning Trees in a Directed Graph*

Takeaki Uno .....	166
-------------------	-----

*Vertex Ranking of Asteroïdal Triple-Free Graphs*

Ton Kloks, Haiko Müller and C. K. Wong .....	174
--	-----

**Session 5b**

*Recursively Divisible Problems*

Rolf Niedermeier .....	183
------------------------	-----

*$StUSPACE(\log n) \subseteq DSPACE(\log^2 n / \log \log n)$*

Eric Allender and Klaus-Jörn Lange .....	193
--	-----

**Session 6a**

*Finding Edge-Disjoint Paths in Partial  $k$ -trees*

Xiao Zhou, Syurei Tamura and Takao Nishizeki .....	203
--	-----

*Optimal Augmentation for Bipartite Componentwise Biconnectivity in Linear Time*

Tsan-sheng Hsu and Ming-Yang Kao .....	213
--	-----

*Towards More Precise Parallel Biconnectivity Approximation*

Ka Wong Chong and Tak Wah Lam .....	223
-------------------------------------	-----

**Session 6b**

*The Complexity of Probabilistic versus Deterministic Finite Automata*

Andris Ambainis .....	233
-----------------------	-----

*Bounded Length UCFG Equivalence*

B. Litow .....	239
----------------	-----

**Session 7a***The Steiner Minimal Tree Problem in the  $\lambda$ -geometry Plane*

D.T. Lee and C.F. Shen ..... 247

*A Study of the LMT-skeleton*

Siu-Wing Cheng, Naoki Katoh and Manabu Sugai ..... 256

*A New Subgraph of Minimum Weight Triangulations*

Cao An Wang, Francis Chin and Yin-Feng Xu ..... 266

**Session 7b***Dynamic Tree Routing under the “Matching with Consumption” Model*

Grammati E. Pantziou, Alan Roberts and Antonis Symvonis ..... 275

*Dimension-Exchange Token Distribution on the Mesh and the Torus*

Michael E. Houle and Gavin Turner ..... 285

*Directed Hamiltonian Packing in d-dimensional Meshes and Its Application*

Jae-Ha Lee, Chan-Su Shin and Kyung-Yong Chwa ..... 295

**Session 8a***k-Pairs Non-crossing Shortest Paths in a Simple Polygon*

Evanthia Papadopoulou ..... 305

*Minimum Convex Partition of a Polygon with Holes by Cuts in Given Directions*

A. Lingas and V. Soltan ..... 315

**Session 8b***Efficient List Ranking on the Reconfigurable Mesh, with Applications*

Tatsuya Hayashi, Koji Nakano and Stephan Olariu ..... 326

*Periodic Merging Networks*

Mirosław Kutylowski, Krzysztof Loryś and Brigitte Oesterdieckhoff ..... 336

*Minimizing Wavelengths in an All-Optical Ring Network*

Gordon Wilfong ..... 346

**Session 9a***Competitive Analysis of On-line Disk Scheduling*

Tzuoo-Hawn Yeh, Cheng-Ming Kuo, Chin-Laung Lei, and Hsu-Chun Yen ..... 356

*Scheduling Interval Ordered Tasks with Non-uniform Deadlines*

Jacques Verriet ..... 366

**Session 9b***Cryptographic Weaknesses in the Round Transformation Used in a Block Cipher with Provable Immunity Against Linear Cryptanalysis*

Kouichi Sakurai and Yuliang Zheng ..... 376

*The Multi-variable Modular Polynomial and Its Applications to Cryptography*

Tsuyoshi Takagi and Shozo Naito ..... 386

**Session 10a***Bounds and Algorithms for a Practical Task Allocation Model*

Tsan-sheng Hsu and Dian Rae Lopez ..... 397

*Scheduling Algorithms for Strict Multithreaded Computations*

Panagioti Fatourou and Paul Spirakis ..... 407

*On Multi-threaded Paging*

Esteban Feuerstein and Alejandro Strejilevich de Loma ..... 417

**Session 10b***A Fast and Efficient Homophonic Coding Algorithm*

Boris Ryabko and Andrey Fionov ..... 427

*An Improvement of the Digital Cash Protocol of Okamoto and Ohta*

Osamu Watanabe and Osamu Yamashita ..... 436

**Author Index**

447