

# Contents

## Invited Papers

Hilbert's Tenth Problem for Subrings of $\mathbb{Q}$ and Number Fields (Extended Abstract) . . . . .	3
<i>Alexandra Shlapentokh</i>	
Nondeterministic Separations . . . . .	10
<i>Lance Fortnow</i>	
Quantum and Randomized Query Complexities (Extended Abstract) . . . . .	18
<i>Miklos Santha</i>	

## Recursion Theory and Mathematical Logic

Algorithmically Random Functions and Effective Capacities. . . . .	23
<i>Douglas Cenzer and Christopher P. Porter</i>	
Where Join Preservation Fails in the Bounded Turing Degrees of C.E. Sets . . . .	38
<i>Nadine Losert</i>	
Structured Frequency Algorithms . . . . .	50
<i>Kaspars Balodis, Jānis Iraids, and Rūsiņš Freivalds</i>	
Asymptotic Properties of Combinatory Logic . . . . .	62
<i>Maciej Bendkowski, Katarzyna Grygiel, and Marek Zaionc</i>	

## Computational Complexity and Boolean Functions

Some New Consequences of the Hypothesis That P Has Fixed Polynomial-Size Circuits . . . . .	75
<i>Ning Ding</i>	
Computational Complexity Studies of Synchronous Boolean Finite Dynamical Systems . . . . .	87
<i>Mitsunori Ogihara and Kei Uchizawa</i>	
On the Power of Parity Queries in Boolean Decision Trees . . . . .	99
<i>Raghav Kulkarni, Youming Qiao, and Xiaoming Sun</i>	
Card-Based Protocols for Any Boolean Function. . . . .	110
<i>Takuya Nishida, Yu-ichi Hayashi, Takaaki Mizuki, and Hideaki Sone</i>	

Size of Sets with Small Sensitivity: A Generalization of Simon’s Lemma . . .	122
<i>Andris Ambainis and Jevgēnijs Vihrovs</i>	

## Graph Theory

Star Shaped Orthogonal Drawing . . . . .	137
<i>Xin He and Dayu He</i>	
The Domination Number of On-line Social Networks and Random Geometric Graphs . . . . .	150
<i>Anthony Bonato, Marc Lozier, Dieter Mitsche, Xavier Pérez-Giménez, and Paweł Pralat</i>	
A Linear Time Algorithm for Determining Almost Bipartite Graphs . . . . .	164
<i>Dayu He and Xin He</i>	
The First-Order Contiguity of Sparse Random Graphs with Prescribed Degrees. . . . .	177
<i>Nans Lefebvre</i>	
Streaming Algorithms for Smallest Intersecting Ball of Disjoint Balls . . . . .	189
<i>Wanbin Son and Peyman Afshani</i>	
Multi-player Diffusion Games on Graph Classes . . . . .	200
<i>Laurent Bulteau, Vincent Froese, and Nimrod Talmon</i>	
Reconfiguration of Cliques in a Graph. . . . .	212
<i>Takehiro Ito, Hirotaka Ono, and Yota Otachi</i>	
The Complexity of Finding Effectors. . . . .	224
<i>Laurent Bulteau, Stefan Fafianie, Vincent Froese, Rolf Niedermeier, and Nimrod Talmon</i>	
Common Developments of Three Incongruent Boxes of Area 30 . . . . .	236
<i>Dawei Xu, Takashi Horiyama, Toshihiro Shirakawa, and Ryuhei Uehara</i>	
Finding Connected Dense $k$ -Subgraphs . . . . .	248
<i>Xujin Chen, Xiaodong Hu, and Changjun Wang</i>	
The Complexity of Degree Anonymization by Graph Contractions . . . . .	260
<i>Sepp Hartung and Nimrod Talmon</i>	
An Improved Exact Algorithm for Maximum Induced Matching . . . . .	272
<i>Mingyu Xiao and Huan Tan</i>	
Completion of the Mixed Unit Interval Graphs Hierarchy. . . . .	284
<i>Alexandre Talon and Jan Kratochvíl</i>	

Bounded Treewidth and Space-Efficient Linear Algebra. . . . .	297
<i>Nikhil Balaji and Samir Datta</i>	

### Quantum Computing

Quantum Game Players Can Have Advantage Without Discord . . . . .	311
<i>Zhaohui Wei and Shengyu Zhang</i>	
Quantum Circuits for the Unitary Permutation Problem . . . . .	324
<i>Stefano Facchini and Simon Perdrix</i>	

### Parallelism and Statistics

Algorithms in the Ultra-Wide Word Model . . . . .	335
<i>Arash Farzan, Alejandro López-Ortiz, Patrick K. Nicholson, and Alejandro Salinger</i>	
Uniformity of Point Samples in Metric Spaces Using Gap Ratio . . . . .	347
<i>Arijit Bishnu, Sameer Desai, Arijit Ghosh, Mayank Goswami, and Subhabrata Paul</i>	
On Pure Nash Equilibria in Stochastic Games. . . . .	359
<i>Ankush Das, Shankara Narayanan Krishna, Lakshmi Manasa, Ashutosh Trivedi, and Dominik Wojtczak</i>	

### Learning, Automata and Probabilistic Models

Learning from Non-iid Data: Fast Rates for the One-vs-All Multiclass Plug-in Classifiers . . . . .	375
<i>Vu Dinh, Lam Si Tung Ho, Nguyen Viet Cuong, Duy Nguyen, and Binh T. Nguyen</i>	
Deletion Operations on Deterministic Families of Automata . . . . .	388
<i>Joey Eremondi, Oscar H. Ibarra, and Ian McQuillan</i>	
ExplicitPRISMSymm: Symmetry Reduction Technique for Explicit Models in PRISM . . . . .	400
<i>Reema Patel, Kevin Patel, and Dhiren Patel</i>	

### Parameterised Complexity

Kernelization Algorithms for Packing Problems Allowing Overlaps. . . . .	415
<i>Henning Fernau, Alejandro López-Ortiz, and Jazmín Romero</i>	
Parameterized Complexity of Asynchronous Border Minimization. . . . .	428
<i>Robert Ganian, Martin Kronegger, Andreas Pfandler, and Alexandru Popa</i>	

Parametrized Complexity of Length-Bounded Cuts and Multi-cuts . . . . .	441
<i>Pavel Dvořák and Dušan Knop</i>	
Algorithms and Hardness for Signed Domination . . . . .	453
<i>Jin-Yong Lin and Sheung-Hung Poon</i>	
<b>Author Index</b> . . . . .	465

Theory and Applications of Models of Computation  
12th Annual Conference, TAMC 2015, Singapore, May  
18-20, 2015, Proceedings  
Jain, R.; Jain, S.; Stephan, F. (Eds.)  
2015, XII, 466 p. 83 illus., Softcover  
ISBN: 978-3-319-17141-8