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Interval and Chordal Graphs -- Unsplittable Flow in Paths and Trees and Column-Restricted Packing Integer Programs -- Truthful Mechanisms via Greedy Iterative Packing -- Resource Minimization Job Scheduling -- The Power of Preemption on Unrelated Machines and Applications to Scheduling Orders -- New Hardness Results for Diophantine Approximation -- PASS Approximation -- Optimal Sherali-Adams Gaps from Pairwise Independence -- An Approximation Scheme for Terrain Guarding -- Scheduling with Outliers -- Improved Inapproximability Results for Maximum k-Colorable Subgraph -- Improved Absolute Approximation Ratios for Two-Dimensional Packing Problems -- On the Optimality of Gluing over Scales -- On Hardness of Pricing Items for Single-Minded Bidders -- Real-Time Message Routing and Scheduling -- Approximating Some Network Design Problems with Node Costs -- Submodular Maximization over Multiple Matroids via Generalized Exchange Properties -- Robust Algorithms for on Minor-Free Graphs Based on the Sherali-Adams Hierarchy -- Minimizing Average Shortest Path Distances via Shortcut Edge Addition -- Approximating Node-Connectivity Augmentation Problems -- A 7/9 - Approximation Algorithm for the Maximum Traveling Salesman Problem -- Approximation Algorithms for Domatic Partitions of Unit Disk Graphs -- On the Complexity of the Asymmetric VPN Problem -- Contributed Talks of RANDOM -- Deterministic Approximation Algorithms for the Nearest Codeword Problem -- Strong Parallel Repetition Theorem for Free Projection Games -- Random Low Degree Polynomials are Hard to Approximate -- Composition of Semi-LTCs by Two-Wise Tensor Products -- On the Security of Goldreich’s One-Way Function -- Random Tensors and Planted Cliques -- Sampling s-Concave Functions: The Limit of Convexity Based Isoperimetry -- Average-Case Analyses of Vickrey Costs -- A Hypergraph Dictatorship Test with Perfect Completeness -- Extractors Using Hardness Amplification -- How Well Do Random Walks Parallelize? -- An Analysis of Random-Walk Cuckoo Hashing -- Hierarchy Theorems for Property Testing -- Algorithmic Aspects of Property Testing in the Dense Graphs Model -- Succinct Representation of Codes with Applications to Testing -- Efficient Quantum Tensor Product Expanders and k-Designs -- Hellinger Strikes Back: A Note on the Multi-party Information Complexity of AND -- Pseudorandom Generators and Typically-Correct Derandomization -- Baum’s Algorithm Learns Intersections of Halfspaces with Respect to Log-Concave Distributions -- Tolerant Linearity Testing and Locally Testable Codes -- Pseudorandom Bit Generators That Fool Modular Sums -- The Glauber Dynamics for Colourings of Bounded Degree Trees -- Testing ±1-weight halfspace -- Small-Bias Spaces for Group Products -- Small Clique Detection and Approximate Nash Equilibria -- Testing Computability by Width Two OBDDs -- Improved Polynomial Identity Testing for Read-Once Formulas -- Smooth Analysis of the Condition Number and the Least Singular Value.

Sommario/riassunto

This volume contains the papers presented at the 12th International Wo- shop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2009) and the 13th International Workshop on Randomization and Computation (RANDOM 2009), which took place concurrently at the HP - ditorium in UC Berkeley, USA, during August 21-23, 2009. APPROX focuses on algorithmic and complexity issues surrounding the development of e'cient approximate solutions to computationally di'cult problems, and was the 12th in the series after Aalborg (1998), Berkeley (1999), Saarbru ¨cken (2000), Ber- ley (2001), Rome (2002), Princeton (2003), Cambridge (2004), Berkeley (2005), Barcelona (2006), Princeton (2007), and Boston (2008).

RANDOM is concerned with applications of randomness to computational and combinatorial problems, and was the 13th workshop in the series following Bologna (1997), Barcelona (1998), Berkeley(1999),Geneva(2000),Berkeley(2001),Harvard(2002),Prin- ton (2003), Cambridge (2004), Berkeley (2005), Barcelona (2006), Princeton (2007), and Boston (2008). Topics of interest for APPROX and RANDOM are: design and analysis of approximation algorithms, hardness of approximation, small space algorithms, sub-linear time algorithms, streaming algorithms, embeddings and metric space methods, mathematicalprogrammingmethods,combinatorialproblemsingraphs andnetworks,gametheory,markets,andeconomicapplications, geometricpr- lems, packing, covering, scheduling, approximate learning, design and analysis of online algorithms, randomized complexity theory, pseudorandomness and - randomization, randomcombinatorialstructures, randomwalks/Markovchains, expander graphs and randomness extractors, probabilistic proof systems, err-correctingcodes,average-caseanalysis,propertytesting, computationallearning theory, and other applications of approximation and randomness. The volume contains 25 contributed papers, selected by the APPROX Program Committee out of 56 submissions, and 28 contributed papers, selected by the RANDOM Program Committee out of 57 submissions.