

## Contents

<b>Development of the Relational Algebra Motivated by the Practice</b> <i>Antal Buza, Piroska B. Kis</i>	<b>9</b>
<b>Infinite paths with no small angles</b> <i>Imre Bárány, Attila Pór</i>	<b>16</b>
<b>Saturated tilings with dominoes and <math>2 \times 2</math> squares</b> <i>János Barát, Péter Hajnal</i>	<b>24</b>
<b>The node-to-area connectivity augmentation problem: related questions and results</b> <i>Attila Bernáth, Tamás Király</i>	<b>32</b>
<b>Towards Better Modelling of Supermarket</b> <i>Krisztian Buza, Antal Buza</i>	<b>42</b>
<b>On housing markets with duplicate houses</b> <i>Katarína Cechlárová, Tamás Fleiner</i>	<b>49</b>
<b>Stable roommates with free edges</b> <i>Katarína Cechlárová, Tamás Fleiner</i>	<b>60</b>
<b>All 4-Edge-Connected HHD-Free Graphs are <math>\mathbb{Z}_3</math>-Connected</b> <i>Takuro Fukunaga</i>	<b>65</b>
<b>Coloring Vertices and Edges of a Path by Nonempty Subsets of a Set</b> <i>P.N. Balister, E. Győri, R.H. Schelp</i>	<b>75</b>
<b>Multiflow feasibility problem for demand graph <math>K_3 + K_3</math></b> <i>Hiroshi Hirai</i>	<b>82</b>
<b>Extremal stable graphs</b> <i>Illés Horváth, Gyula Y. Katona</i>	<b>92</b>
<b>Construction of Hamilton path tournament designs</b> <i>Yoshiko T. Ikebe, Akihisa Tamura</i>	<b>102</b>
<b>Augmenting Edge-Connectivity between Vertex Subsets</b> <i>Toshimasa Ishii, Kazuhisa Makino</i>	<b>109</b>
<b>Submodular Function Minimization under Covering Constraints</b> <i>Satoru Iwata, Kiyohito Nagano</i>	<b>121</b>
<b>Inductive Constructions in the Analysis of Two-Dimensional Rigid Structures</b> <i>Bill Jackson, Tibor Jordán</i>	<b>131</b>
<b>Matching Structure of Symmetric Bipartite Graphs and a Generalization of Pólya's Problem</b> <i>Naonori Kakimura</i>	<b>141</b>

<b>Enumerating Non-crossing Geometric Graphs</b>	<b>151</b>
<i>Naoki Kato, Shin-ichi Tanigawa</i>	
<b>Local topological toughness and local factors</b>	<b>161</b>
<i>Frank Göring, Gyula Y. Katona</i>	
<b>Hadwiger's Conjecture is Decidable</b>	<b>167</b>
<i>Ken-ichi Kawarabayashi, Bruce Reed</i>	
<b>Maximum Number of Cycles and Hamiltonian Cycles in Sparse Graphs</b>	<b>175</b>
<i>Zoltán Király</i>	
<b>Square-Free 2-Matchings in Bipartite Graphs and Jump Systems</b>	<b>187</b>
<i>Yusuke Kobayashi, Kenjiro Takazawa</i>	
<b>How to use combinatorial tools in secret sharing problem on graphs</b>	<b>198</b>
<i>László Csirmaz, Péter Ligeti</i>	
<b>Optimization and Enumeration</b>	<b>207</b>
<i>Martin Loebl</i>	
<b>Berge Multiplication for Monotone Boolean Dualization</b>	<b>208</b>
<i>Endre Boros, Khaled Elbassioni, Kazuhisa Makino</i>	
<b>Constant ratio fixed-parameter approximation of the edge multicut problem</b>	<b>226</b>
<i>Dániel Marx, Igor Razgon</i>	
<b>A family of polytopal digraphs that do not satisfy the shelling property</b>	<b>236</b>
<i>David Avis, Hiroyuki Miyata, Sonoko Moriyama</i>	
<b>Simultaneous Singular Value Decomposition</b>	<b>247</b>
<i>Takanori Maehara, Kazuo Murota</i>	
<b>Toward Characterization of Vertex-edge Graphs of Three-dimensional Nonconvex Polyhedra</b>	<b>256</b>
<i>Seok-Hee Hong, Hiroshi Nagamochi</i>	
<b>On Abstract Rigidity Matroids</b>	<b>274</b>
<i>Viet-Hang Nguyen</i>	
<b>A lower bound for tree-width of Cartesian product graphs</b>	<b>280</b>
<i>Kyohei Kozawa, Yota Otachi, Koichi Yamazaki</i>	
<b>Polychromatic colorings of arbitrary rectangular partitions</b>	<b>289</b>
<i>Dániel Gerbner, Balázs Keszegh, Nathan Lemons, Cory Palmer, Dömötör Pálvölgyi, Balázs Patkós</i>	

<b>A note on kernels and Sperner's lemma</b>	<b>298</b>
<i>Tamás Király, Júlia Pap</i>	
<b>Is this matrix singular?</b>	<b>305</b>
<i>András Recski</i>	
<b>Partition Critical Hypergraphs</b>	<b>312</b>
<i>Zoltán Füredi, Attila Sali</i>	
<b>Subclasses of cg-matroids</b>	<b>317</b>
<i>Yoshio Sano</i>	
<b>Parameterized Graph Cleaning Problems</b>	<b>323</b>
<i>Dániel Marx, Ildikó Schlotter</i>	
<b>A divide-and-conquer approach for polymatroid optimization with application to preemptive scheduling problems</b>	<b>333</b>
<i>N. Shakhlevich, A. Shioura, V. Strusevich</i>	
<b>Pebbling Weighted Graphs</b>	<b>343</b>
<i>Nándor Sieben</i>	
<b>Necklace splitting and the Tucker-Bacon theorem</b>	<b>348</b>
<i>Gábor Simonyi</i>	
<b>Matroidal Characterization on Index of DAEs in Hybrid Analysis for General Circuits</b>	<b>351</b>
<i>Satoru Iwata, Mizuyo Takamatsu, Caren Tischendorf</i>	
<b>A Weighted Independent Even Factor Algorithm</b>	<b>361</b>
<i>Kenjiro Takazawa</i>	
<b>A Proof of the Molecular Conjecture</b>	<b>372</b>
<i>Naoki Katoh, Shin-ichi Tanigawa</i>	
<b>Geometric Routing on Ad-Hoc Networks</b>	<b>381</b>
<i>Takeshi Tokuyama</i>	
<b>Asymptotic values of graph parameters</b>	<b>388</b>
<i>Ágnes Tóth</i>	
<b>Coloring intervals with four types of constraints</b>	<b>393</b>
<i>Csilla Bujtas, Zsolt Tuza</i>	