Algorithmica (2018) 80:827–829
https://doi.org/10.1007/s00453-017-0394-1

Guest Editorial: Special Issue on Theoretical Informatics

Evangelos Kranakis[1] · **Gonzalo Navarro**[2]

Published online: 13 November 2017

This special issue is dedicated to selected papers from the 12th Latin American Symposium on Theoretical Informatics (LATIN), which was held on April 11–15, 2016, in Ensenada, Mexico. The conference includes a wide range of topics in theoretical computer science that reflect the broad interests of the LATIN community, including algorithms, analytic and enumerative combinatorics, analysis of algorithms, approximation algorithms, automata theory, combinatorics and graph theory, complexity theory, computability, computational algebra, computational geometry, data structures, graph drawing, and random structures. All the papers in this issue went through a rigorous refereeing process and were accepted on the basis of quality. Following is a brief outline of the accepted papers.

In *Routing in unit disk graphs*, Kaplan, Mulzer, Roditty, and Seiferth show how to construct, for any given $\epsilon > 0$, a routing scheme for a unit-disk graph on a set of points S with stretch $1 + \epsilon$, using labels of $O(\log n)$ bits and routing tables of $O(\epsilon^{-5} \log^2 n \log^2 D)$ bits, where D is the (Euclidean) diameter of the graph and the header size is $O(\log n \log D)$ bits.

Stabbing circles for sets of segments in the plane, by Claverol, Khramtcova, Papadopoulou, Saumell, and Seara, is concerned with stabbing a set S of circles in the plane by a line. The problem is shown to be tightly connected to cluster Voronoi diagrams and the authors provide a method to compute a representation of all the com-

✉ Gonzalo Navarro
gnavarro@dcc.uchile.cl

Evangelos Kranakis
kranakis@scs.carleton.ca

1 School of Computer Science, Carleton University, Ottawa, Canada

2 Department of Computer Science (DCC), Faculty of Physical and Mathematical Sciences, University of Chile, Santiago, Chile

binatorially different stabbing circles for S, and the stabbing circles with maximum and minimum radius.

In *Tree compression using string grammars*, Ganardi, Hucke, Lohrey, and Noeth study the compressed representation of a ranked tree by a (string) straight-line program (SLP) for its preorder traversal, and compare it with the well-studied representation by straight-line context-free tree grammars.

Independent set of convex polygons: from n^ϵ to $1+\epsilon$ via shrinking by Wiese, is concerned with computing a maximum-weight subset of non-overlapping polygons from a given set of weighted convex polygons in the plane. By shrinking the polygons a factor $1-\delta$, for an arbitrarily small constant $\delta > 0$, the author is able to improve the approximation ratio from n^ϵ to $(1+\epsilon)$.

In *Improved spanning ratio for low degree plane spanners*, Bose, Hill, and Smid describe an algorithm that builds a plane spanner with a maximum degree of 8 and a spanning ratio of ≈ 4.414 with respect to the complete graph. This is the best currently known spanning ratio for a plane spanner with a maximum degree of less than 14.

In the paper *On the planar split thickness of graphs*, Eppstein, Kindermann, Kovourov, Liotta, Lubiw, Maignan, Mondal, Vosoughpour, Whitesides, and Wismath investigate the planar split thickness of a graph, that is, the smallest k such that the graph is k-splittable into a planar graph. They study the concept for complete graphs, complete bipartite graphs, multipartite graphs, bounded degree graphs, and genus-1 graphs, and prove that it is NP-hard to recognize graphs that are 2-splittable into a planar graph.

In *Simple approximation algorithms for balanced MAX 2SAT*, Paul, Poloczek, and Williamson study algorithms for the balanced MAX 2SAT problem. They show that such instances have a simple structural property from which they are able to show that a large class of greedy algorithms, including Johnson's algorithm, gives a 3/4-approximation algorithm for balanced MAX 2SAT.

In *Faster information gathering in ad-hoc radio tree networks*, Chrobak and Costello provide two deterministic algorithms for gathering in unknown, ad-hoc networks with tree topologies. For the model that does not assume any collision detection nor acknowledgement mechanisms, they give an $O(n \log\log n)$-time algorithm and also show that this running time can be further reduced to $O(n)$ if the model allows for acknowledgements of successful transmissions.

In *Improved approximation algorithms for capacitated fault-tolerant k-center*, Fernandes, de Paula and Pedrosa are concerned with capacitated α-fault-tolerant k-center, where the centers have a limit on the number of assigned elements, and, if any α centers fail, there is a reassignment from the metric space V to non-faulty centers. They present a new approach to tackle fault tolerance, by selecting and pre-opening a set of backup centers, then solving the obtained residual instance and analyzing the resulting approximation factors.

In *Comparison-based buffer management in QoS switches*, Al-Bawani, Englert, and Westermann are concerned with the following online problem arising in network devices. In each time step, an arbitrary number of packets arrive at a single buffer and only one packet can be transmitted. The differentiated service concept is implemented by attributing each packet with a non-negative value corresponding to its service level. The goal is to maximize the total value of transmitted packets. They consider the FIFO

and the bounded-delay model. In the former model they show a $1 + 1/\sqrt{2}$ lower bound on the competitive ratio of any deterministic comparison-based algorithm, while in the latter they show that no deterministic comparison-based algorithm exists with a competitive ratio below 2.

We would like to express our deepest appreciation to the authors of the papers, the referees for their careful and valuable reviews, and Ming-Yang Kao, the editor-in-chief of Algorithmica, for giving us the opportunity to edit this special issue.