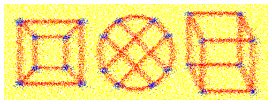
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# Special Issue of Selected Papers from the 25th International Symposium on Graph Drawing and Network Visualization (GD 2017) Guest Editors' Foreword

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This special issue of the Journal of Graph Algorithms and Applications is dedicated to some of the best papers from the $25^{\text{th}}$ International Symposium on Graph Drawing and Network Visualization, which was held in Boston, September 25-27, 2017. The symposium was hosted by the Northeastern University, with Cody Dunne and Alan Keahey as co-chairs of the organizing committee.

The authors of six of the best papers presented at the symposium were invited to submit a revised and extended version of their work to this special issue. The submitted papers went through the standard reviewing process of the journal and were accepted after further revisions. They span a broad range of topics of interest for the Graph Drawing and Network Visualization community, covering both applied and theoretical aspects of the research field.

- Mchedlidze, Radermacher, and Rutter consider the following problem. Given a topological graph $G$ and an arrangement $\mathcal{A}$ of pseudolines, do a planar straight-line drawing $\Gamma$ of $G$ and an arrangement $A$ of straight lines exist that are homeomorphic to $G$ and $\mathcal{A}$? The authors give a positive answer to this question if $\mathcal{A}$ is stretchable and every edge of $G$ either entirely lies on a pseudoline in $\mathcal{A}$ or has at most one intersection with $\mathcal{A}$. This strengthens a previous result of Da Lozzo et al. The authors also consider the related problem of deciding, for a given a planar graph $G$ and a subset $S$ of its vertices, whether a planar straight-line drawing of $G$ exists such that the vertices in $S$ are collinear. They prove that the problem is $\mathcal{NP}$-complete but fixed-parameter tractable in the size of $S$.

- Sitchinava and Strash study the complexity of the visibility graph reconstruction problem for orthogonal polygons. In this problem one is given a graph $G$ and the goal is to construct an orthogonal polygon whose visibility graph is $G$. The authors show that the graph reconstruction problem is solvable in polynomial time for uniform-length orthogonally-convex polygons and is fixed-parameter tractable for uniform-length histogram polygons. Prior to this work, very little was known about the visibility graph reconstruction problem for orthogonal polygons, with the exception of some results on staircase polygons.

- Eppstein studies how the planarization of a graph affects its width parameters. He shows that the complete bipartite graph $K_{3,n}$ has bounded treewidth, pathwidth, branchwidth, tree-depth, and clique-width, however in every planarization of $K_{3,n}$ the same parameters have value $\Omega(n)$. Conversely, Eppstein proves that every graph with bounded bandwidth, cutwidth, or carving width has a planarization with linear size and with bounded paramater value and that the same is true for the treewidth, pathwidth, branchwidth, and clique-width of bounded-degree graphs.

- Eppstein provides upper bounds for the maximum number of edges of triangle-free penny graphs and squaregraphs. Penny graphs are the contact graphs of unit circles in the plane, while squaregraphs are the graphs that can be embedded in the plane so that every internal face is a delimited

by a 4-cycle and every internal vertex has degree at least 4. The bound on triangle-free penny graphs almost settles a conjecture of Swanepoel. Eppstein also studies the degeneracy of triangle-free penny graphs, i.e., the minimum number $d$ such that every subgraph of a triangle-free penny graph has a vertex of degree at most $d$.

- Kindermann, Meulemans, and Schulz present the outcomes of an experimental study aimed at assessing whether being composed of few segments is a relevant quality measure for the readability of a straight-line graph drawing. The user study designed by the authors focused on trees and graphs from the ROMA library. Drawings produced by algorithms devised by the authors with the goal of keeping the number of segments low were put in comparison with drawings produced by standard algorithms. The more than 100 people who participated in the user study were asked to evaluate the drawings from an aesthetical perspective and to answer shortest-path and longest-distance queries by inspecting the drawings.

- Ballweg, Pohl, Wallner, and von Landesberger study how humans perceive the similarity of directed acyclic graphs, with a special focus on the determination of the factors that affect the perception of similarity the most. The investigation performed by the authors indicates the number of levels, the number of nodes on a specific level, and the overall shape of the graph representation as the main influencing factors. The analysis conducted by the authors is based on a card-sorting methodology, employing small and unlabeled directed acyclic graphs, aimed at identifying the groups of directed acyclic graphs that are perceived as similar by the participants and the reason behind the participants' choice.

We thank the authors for contributing their high-quality papers, the referees for their valuable work, and the staff of the Journal of Graph Algorithms and Applications for making this special issue possible.