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From tree-decompositions to clique-width terms. (English) Zbl 1395.05097
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Summary: Tree-width and clique-width are two important graph complexity measures that serve as parameters in many fixed-parameter tractable algorithms. We give two algorithms that transform tree-decompositions represented by normal trees into clique-width terms (a rooted tree is normal for a graph if its nodes are the vertices of the graph and every two adjacent vertices are on a path of the tree starting at the root). As a consequence, we obtain that, for certain classes of sparse graphs, clique-width is polynomially bounded in terms of tree-width. It is even linearly bounded for planar graphs and incidence graphs. These results are useful in the construction of model-checking algorithms for problems described by monadic second-order formulae, including those allowing edge set quantifications.

MSC:

- 05C42 Density (toughness, etc.)
- 05C10 Planar graphs; geometric and topological aspects of graph theory
- 05C12 Distance in graphs
- 05C85 Graph algorithms (graph-theoretic aspects)

Cited in 4 Documents

Keywords:

tree-width; clique-width; sparse graph; planar graph; incidence graph; fixed-parameter tractable algorithm

Software:

ComputeTW

Full Text: [DOI](#)

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