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Characterizing and finding forbidden subgraphs for subclasses of circular-arc graphs

The intersection graph of a set $\mathcal{A}$ of arcs on a circle is a graph having one vertex for each arc in $\mathcal{A}$ and such that two different vertices are adjacent if and only if the corresponding arcs have nonempty intersection. A graph G is a circular-arc graph if and only if G is the intersection graph of some set $\mathcal{A}$ of arcs on a circle; if so, the set $\mathcal{A}$ is called a circular-arc model of G. Forbidden structures for the class of circular-arc graphs and its main subclasses (including subclasses of interval graphs), as well as efficient algorithms for finding these forbidden structures, have received a great deal of attention. In this work, we will present some recent results regarding minimal forbidden induced subgraph characterizations and linear-time algorithms for finding an instance of such forbidden subgraphs for some subclasses of circular-arc graphs, including normal Helly circular-arc graphs, concave-round graphs (also known as Tucker circular-arc graphs or Γ circular-arc graphs), and Helly circular-arc graphs. Results on normal Helly circular-arc graphs are joint work with Yixin Cao and Luciano N. Grippo.