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Tree-depth primer

The tree-depth of a graph G is the minimum height of a rooted forest, the closure of which contains G . This invariant (and close relatives) has been introduced in several contexts under different names. It is also related to the cycle rank of directed graphs and the star height of regular languages. We mention recently defined variants like schrüb-depth, which presents several interesting problems.

We survey and analyze the properties of classes of graphs with bounded tree-depth, and study how these properties propagate via the so-called "low tree-depth decompositions" of sparse graphs (and structures).