Elimination-Width, Properties and Applications

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Abstract

Fernau and Meister define the Elimination-Width of digraphs, which is a generalization of the Kelly-width notion by Hunter and Kreutzer.

Many Digraph Width-Measures have been proposed in the pursuit of a parameter that has a similar impact for directed graphs, as tree-width had for undirected graphs. What makes Elimination-Width interesting is that it is not neccessarily constant for DAGs. This is a shortcoming of most digraph width-measures (including Kelly-width), as many $\mathcal{NP}$-complete digraph-problems remain $\mathcal{NP}$-complete on DAGs (e.g. Dominating Set, Disjoint Paths,...). Hence, these problems cannot be FPT in such Width-Measures.

We will examine some properties and algorithmic applications of this new width-measure.