

Capturing Polynomial Time on Chordal Comparability Graphs

Berit Grußien / Humboldt-Universität zu Berlin

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The central open problem in descriptive complexity theory is the question of whether there exists a logic that characterizes, or captures, the complexity class PTIME. Recently, it was shown by Grohe that fixed-point logic with counting captures PTIME on all classes of graphs with excluded minors. The question for further interesting graph classes for which we can find a logic capturing PTIME leads us to classes of graphs closed under induced subgraphs.

In my talk I will show that fixed-point logic with counting captures PTIME on chordal comparability graphs. The result is based on a graph decomposition, known as the modular decomposition, which was introduced by Gallei in 1976. It is one of few results for which PTIME is captured on a graph class that is closed under induced subgraphs.