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Embeddings of graphs of fixed treewidth and bounded degree

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Abstract

Let F be any family of graphs of fixed treewidth and bounded degree. We construct a quadratic-time algorithm for calculating the genus distribution of the graphs in F . Within a post-order traversal of the decomposition tree, the algorithm involves a full-powered upgrading of *production rules* and *root-popping*. This algorithm for calculating genus distributions in quadratic time complements an algorithm of Kawarabayashi, Mohar, and Reed for calculating the minimum genus of a graph of bounded treewidth in linear time.

Keywords

Genus distribution, partial genus distribution, treewidth, tree decomposition

Math. Subj. Class.: 05C10

Vložitve grafov fiksne širine dreves in omejene stopnje

Povzetek

Naj bo F poljubna družina grafov fiksne širine dreves in omejene stopnje. Konstruiramo algoritem kvadratno-časovne kompleksnosti za izračun porazdelitve rodov grafov iz F . Poleg ureditve in pregleda dekompozicijskega drevesa algoritem vključuje močno nadgraditev *produkcijskih pravil* in *korenjenja*. Ta algoritem za izračun porazdelitev rodov v kvadratnem času dopolnjuje algoritem Kawarabyashija, Moharja in Reeda za izračun minimalnega roda grafa omejene širine dreves v linearnem času.

Ključne besede

Porazdelitev rodov, parcialna porazdelitev rodov, drevesna širina, drevesna dekompozicija