Fast exact algorithm for $L(2,1)$-labeling of graphs. (English) Zbl 1333.05292


Summary: An $L(2,1)$-labeling of a graph is a mapping from its vertex set into nonnegative integers such that the labels assigned to adjacent vertices differ by at least 2, and labels assigned to vertices of distance 2 are different. The span of such a labeling is the maximum label used, and the $L(2,1)$-span of a graph is the minimum possible span of its $L(2,1)$-labelings. We show how to compute the $L(2,1)$-span of a connected graph in time $O^*(2.6488^n)$. Previously published exact exponential time algorithms were gradually improving the base of the exponential function from 4 to the so far best known $3.2361$, with 3 seemingly having been the Holy Grail.

For the entire collection see [Zbl 1213.68052].

MSC:

05C85 Graph algorithms (graph-theoretic aspects)
05C78 Graph labelling (graceful graphs, bandwidth, etc.)
68Q25 Analysis of algorithms and problem complexity