DETERMINING L(2,1)-SPAN IN POLYNOMIAL SPACE

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The $L(2,1)$-labeling is a graph coloring model which arises from channel assignment in telecommunication. It asks for such a labeling with nonnegative integer labels, that no vertices in distance 2 in a graph have the same label and labels of adjacent vertices differ by at least 2.

By $\lambda(G)$ we denote an $L(2,1)$-span of G, which is the smallest value of k, for which there exists an $L(2,1)$-labeling of G with no label exceeding k.

Determining if $\lambda(G) \leq 4$ was proven to be NP-complete for any $k \geq 4$ by Fiala *et al.* [1] (for $k \leq 3$ the problem is polynomial).

The fastest currently known exact algorithm for $L(2,1)$-labeling works in time $O^*(2.6488^n)$ and exponential space [2].

In this talk we present the first algorithm for $L(2,1)$-labeling with time complexity $O(c^n)$ for some constant c and polynomial space complexity [3].

The algorithm works in time $O((9+\epsilon)^n)$ (where ϵ is an arbitrarily small positive constant) and is based on a divide and conquer approach.

Keywords: $L(2,1)$-labeling, exact algorithm, polynomial space.

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References

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