

Approximating Minimum Convex Recoloring and Maximum Disjoint Paths on Graphs of Bounded Tree Width

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Abstract

A coloring of the vertices of a graph is called convex if, for each color c , the subgraph induced by all vertices of G colored with c is connected. We consider the problem of recoloring a colored graph with a minimal number of color changes such that the resulting coloring is convex. This problem solves a special kind of routing problem, where in a network different sets of clients want to be connected by different disjoint subnetworks. Several variants of the problem including the maximum disjoint paths problem are shown to be NP-hard on graphs of bounded tree width. Moreover, we present some approximation algorithms for several variants of the problem on graphs of bounded tree width.