

Bodlaender, Hans L.; de Fluiter, Babette

On intervalizing k -colored graphs for DNA physical mapping. (English) Zbl 0867.92008
Discrete Appl. Math. 71, No. 1-3, 55-77 (1996).

Summary: The problem of determining whether a given k -colored graph is a subgraph of a properly colored interval graph has an application in DNA physical mapping. We study the problem for the case that the number of colors k is fixed. For $k = 2$, we give a simple linear time algorithm, for $k = 3$, we give an $O(n^2)$ algorithm for biconnected graphs with n vertices, and for $k = 4$, we show that the problem is NP-complete.

MSC:

92C40 Biochemistry, molecular biology
92D20 Protein sequences, DNA sequences
05C90 Applications of graph theory
05C15 Coloring of graphs and hypergraphs
05C38 Paths and cycles
68Q25 Analysis of algorithms and problem complexity

Cited in 15 Documents

Keywords:

sequence reconstruction; molecular biology; colored interval graph; $O(n^2)$ algorithm for biconnected graphs

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