

Benkour, A.; Manoussakis, Y.; Saad, R.

Alternating cycles through fixed vertices in edge-colored graphs. (English) Zbl 0813.05042
J. Comb. Math. Comb. Comput. 16, 199-207 (1994).

Alternating cycles (i.e. cycles such that no consecutive edges have the same color) are of interest in combinatorics. This paper proves that deciding if there exists an alternating cycle through two fixed vertices in an edge-colored complete graph is NP-hard. It also establishes a necessary and sufficient condition for the existence of an alternating cycle containing a vertex in a k -edge-colored complete graph K_n^c . The authors give an $O(n^2)$ algorithm for finding a cycle through two given vertices in a bipartite tournament of order n . This improves an $O(n^3)$ algorithm recently published by *Y. Manoussakis* and *Z. Tuza* [*SIAM J. Discrete Math.* 3, No. 4, 537-543 (1990; [Zbl 0715.05042](#))].

Reviewer: J.Pallo (Dijon)

MSC:

- [05C38](#) Paths and cycles
- [05C15](#) Coloring of graphs and hypergraphs
- [05C85](#) Graph algorithms (graph-theoretic aspects)
- [68Q25](#) Analysis of algorithms and problem complexity
- [68R10](#) Graph theory (including graph drawing) in computer science

Cited in **2** Documents

Keywords:

edge-colored graphs; color; alternating cycle; bipartite tournament; algorithm