

## An Optimization Model for Maximum Clique Problem Based on Semidefinite Programming

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**Abstract :** The topic of this article is to exploring the potentialities of a powerful optimization technique, namely Semidefinite Programming, for solving NP-hard problems. This approach provides tight relaxations of combinatorial and quadratic problems. In this work, we solve the maximum clique problem using this relaxation. The clique problem is the computational problem of finding cliques in a graph. It is widely acknowledged for its many applications in real-world problems. The numerical results show that it is possible to find a maximum clique in polynomial time, using an algorithm based on semidefinite programming. We implement a primal-dual interior points algorithm to solve this problem based on semidefinite programming. The semidefinite relaxation of this problem can be solved in polynomial time.

**Keywords :** semidefinite programming, maximum clique problem, primal-dual interior point method, relaxation

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