Maximum Clique Conformance Measure for Graph Coloring Algorithms

Abstract

The Graph Coloring Problem (GCP) is an essential problem in graph theory, and it has many applications such as the exam scheduling problem, register allocation problem, timetabling, and frequency assignment. The maximum clique problem is also another important problem in graph theory and it arises in many real life applications like managing the social networks. These two problems have received a lot of attention by the scientists, not only for their importance in the real life applications, but also for their theoretical aspect. Solving these problems however remains a challenge, and the proposed algorithms for this purpose apply to rather small graphs, whereas many real life application graphs encompass hundreds or thousands of nodes. This paper presents a new measure for evaluating the efficiency of graph coloring algorithms. The new measure computes the clique conformance index (CCI) of a graph coloring algorithm. CCI measures the rate of deviation of a coloring algorithm from the maximum clique during the process of coloring a graph. The paper presents empirical measurement for two coloring algorithms proposed by the authors.
References


Index Terms

Computer Science  Algorithms
Keywords

Algorithms, Clique conformance Index, Convergence Rate, Deviation Rate, Graph Coloring, Maximum Clique.