Tabu search for the cyclic bandwidth problem

Titre	Tabu search for the cyclic bandwidth problem
Type de publication	Article de revue
Auteur	Rodriguez-Tello, Eduardo [1], Romero-Monsivais, Hillel [2], Ramirez-Torres, Gabriel [3], Lardeux, Frédéric [4]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2015
Langue	Anglais
Date	Jan-05-2015
Pagination	17–32
Volume	57
Titre de la revue	Computers & Operations Research
ISSN	03050548
Mots-clés	Best-known bounds [5], Cyclic bandwidth problem [6], tabu search [7]
Résumé en anglais	The Cyclic Bandwidth (CB) problem for graphs consists in labeling the vertices of a guest graph G by distinct vertices of a host cycle Cn (both of order n) in such a way that the maximum distance in the cycle between adjacent vertices in G is minimized. To the best of our knowledge, this is the first research work investigating the use of metaheuristic algorithms for solving this challenging combinatorial optimization problem in the case of general graphs. In this paper a new carefully devised Tabu Search algorithm, called TScb, for finding near-optimal solutions for the CB problem is proposed. Different possibilities for its key components and input parameter values were carefully analyzed and tuned, in order to find the combination of them offering the best quality solutions to the problem at a reasonable computational effort. Extensive experimentation was carried out, using 113 standard benchmark instances, for assessing its performance with respect to a Simulated Annealing (SAcb) implementation. The experimental results show that there exists a statistically significant performance amelioration achieved by TScb with respect toSAcb in 90 out of 113 graphs (79.646%). It was also found that our TScb algorithm attains 56 optimal solutions and establishes new better upper bounds for the other 57 instances. Furthermore, these competitive results were obtained expending reasonable computational times.
URL de la notice	http://okina.univ-angers.fr/publications/ua8014 [8]
DOI	10.1016/j.cor.2014.11.013 [9]
Titre abrégé	Computers & Operations Research

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[9] http://dx.doi.org/10.1016/j.cor.2014.11.013

Publié sur *Okina* (http://okina.univ-angers.fr)