Two phased hybrid local search for the periodic capacitated arc routing problem

Titre	Two phased hybrid local search for the periodic capacitated arc routing problem
Type de publication	Article de revue
Auteur	Chen, Yuning [1], Hao, Jin-Kao [2]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2018
Langue	Anglais
Date	1er Janv. 2018
Numéro	1
Pagination	55-65
Volume	264
Titre de la revue	European Journal of Operational Research
ISSN	03772217
Mots-clés	Bi-level optimization [3], Capacitated arc routing [4], Constrained combinatorial search [5], Heuristics [6]
Résumé en anglais	The periodic capacitated arc routing problem (PCARP) is a challenging general model with important applications. The PCARP has two hierarchical optimization objectives: a primary objective of minimizing the number of vehicles (Fv) and a secondary objective of minimizing the total cost (Fc). In this paper, we propose an effective two phased hybrid local search (HLS) algorithm for the PCARP. The first phase makes a particular effort to optimize the primary objective while the second phase seeks to further optimize both objectives by using the resulting number of vehicles of the first phase as an upper bound to prune the search space. For both phases, combined local search heuristics are devised to ensure an effective exploration of the search space. Experimental results on 63 benchmark instances demonstrate that HLS performs remarkably well both in terms of computational efficiency and solution quality. In particular, HLS discovers 44 improved best known values (new upper bounds) for the total cost objective Fc while attaining all the known optimal values regarding the objective of the number of vehicles Fv. To our knowledge, this is the first PCARP algorithm reaching such a performance. Key components of HLS are analyzed to better understand their contributions to the overall performance.
URL de la notice	http://okina.univ-angers.fr/publications/ua16543 [7]
DOI	10.1016/j.ejor.2017.06.025 [8]
Lien vers le document	http://www.sciencedirect.com/science/article/pii/S0377221717305647?via%3... [9]
Titre abrégé	Eur. J. oper. res.

Liens
[1] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=10752
[2] http://okina.univ-angers.fr/jinkao.hao/publications
[3] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=23974
[4] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=23973
[5] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=23975
[6] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=3676
[7] http://okina.univ-angers.fr/publications/ua16543
[8] http://dx.doi.org/10.1016/j.ejor.2017.06.025
[9] http://www.sciencedirect.com/science/article/pii/S0377221717305647?via%3Dihub