

Adaptive Diversification Metaheuristic for the Fleet Size and Mix Vehicle Routing Problem with Time Windows

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We shall describe a new and efficient hybrid metaheuristic algorithm for the fleet size and mix vehicle routing problem with time windows to minimize the total cost of the heterogeneous vehicle fleet and total distance (or duration) traveled. In spite of its significant practical relevance the problem has only recently received increased research attention.

The initial solution is constructed by a savings-based insertion heuristic and the improvement stage relies on simple route splitting, route elimination and ICROSS and IOPT heuristics. These four heuristics are guided by a hybrid metaheuristic that combines the deterministic annealing metaheuristic of Bräysy et al. (2007) with tabu search, arc-history based systematic diversification and intelligent search limitation rules, reminiscent of the record-to-record travel metaheuristic. The computational testing on 712 benchmark problems shows that the suggested method is competitive and well-scalable, reporting several new best-known solutions.

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