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Summary: A multi-objective vehicle routing and scheduling problem with uncertainty in priority and request of customers is presented. In the proposed model, a set of dynamic requests is received over time, and the planner does not have any information regarding their location and size until they arrive. Moreover, the routing model aims to satisfy different customers according to their specific time windows which were predefined by an expert as (being very important, important, casual or unimportant). This paper uses the proposed model as a multi-objective problem where the total required number of vehicles, the total distance travelled and the waiting time imposed on vehicles are minimized, and the total customers’ satisfaction for service is maximized. An efficient framework for solving this model is designed and its performance is evaluated in different steps for various test problems generalized from Solomon’s VRPTW benchmark problems. The various heuristics and improvement concepts incorporate local exploitation in the evolutionary search, and the concept of Pareto optimality for the multi-objective optimization is used in the proposed procedure. The computational experiments on data sets illustrate the efficiency and effectiveness of the proposed approach.

MSC:
- 90C29 Multi-objective and goal programming
- 90B35 Deterministic scheduling theory in operations research
- 90B06 Transportation, logistics and supply chain management

Keywords:
vehicle routing and scheduling problem; multi-objective optimization; uncertainty in request; satisfaction level

Software:
MACS-VRPTW

Full Text: DOI

References:
[10] Dondo, R; Cerda, J, A hybrid local improvement algorithm for large-scale multi-depot vehicle routing problems with time...


Juan, A; Faulin, J; Garsman, S; Riera, D; Marull, J; Mendez, C, Using safety stocks and simulation to solve the vehicle routing problem with stochastic demands, Transp Res C, 19, 751-765, (2011) - doi:10.1016/j.trc.2010.09.007


Sheng, HH; Wang, JC; Huang, HH; Yen, DC, Fuzzy measure on vehicle routing problem of hospital materials, Exp Syst Appl,


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