# A heuristic approach for the vehicle routing problem with scarce, reusable resources

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## Abstract

This work presents an efficient methodology for the vehicle routing problem with scarce, reusable resources (VRPSRS), in the context of the VeRoLog Solver Challenge Part II (Traditional). The proposed methodology rapidly produces an initial scheduling of the pickups and deliveries of tools within a planning horizon that is obtained by solving a Mixed Integer Programming (MIP) model. The solution generated is used to feed a routing-based heuristic algorithm that aims at finding a feasible solution for the VRPSRS. The routing algorithm is comprised of a randomized constructive strategy that prioritizes the Pickup First-Delivery Second types of routes, and a local search procedure to improve obtained solutions by means of intra- and inter-route neighborhood structures. Results are validated on the challenge platform for the available instances, suggesting that the proposed methodology requires low CPU times to achieve high-quality solutions.

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