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Order Picking Problem: An Exact and Heuristic Algorithms for the Generalized Travelling Salesman Problem With Geographical Overlap Between Clusters

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Abstract : The generalized traveling salesman problem (GTSP) is an extension of the traveling salesman problem (TSP) where the set of nodes is partitioned into clusters, and the salesman must visit exactly one node per cluster. In this research, we apply the definition of the GTSP to an order picker routing problem with multiple locations per product. As such, each product represents a cluster and its corresponding nodes are the locations at which the product can be retrieved. To pick a certain product item from the warehouse, the picker needs to visit one of these locations during its pick tour. As all products are scattered throughout the warehouse, the product clusters not separated geographically. We propose an exact LP model as well as heuristic and meta-heuristic solution algorithms for the order picking problem with multiple product locations.

Keywords : warehouse optimization, order picking problem, generalised travelling salesman problem, heuristic algorithm
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