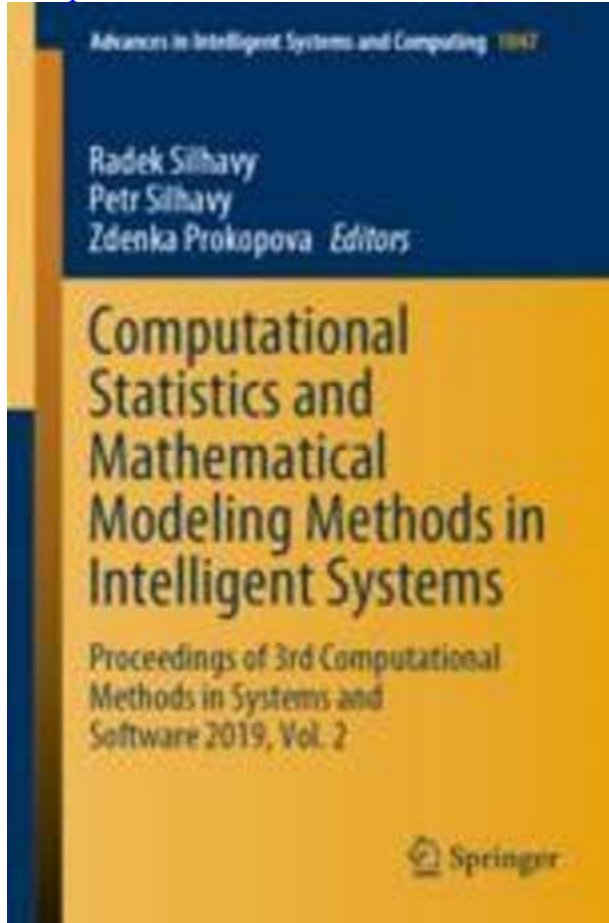


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An Improved Location Model for the Collection of Sorted Solid Waste in Densely Populated Urban Centres

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Abstract

This paper presents a facility location model for improving the collection of solid waste materials. The model is especially suitable for densely populated regions with several housing units as well as encourages initial sorting of wastes. Each individual house in the collection area is designated a customer, with randomly selected customers comprising the set of candidate hubs. The fundamental feature of the model is to group the customers into clusters by assigning each customer (house) to the nearest hub. Each cluster is then assigned to exactly one waste collection site drawn from the set of potential collection locations. The objective is to minimize the total number of activated waste collection sites such that all the customers' requests are satisfied without violating the capacity limit of each site. A simple Lagrangian relaxation heuristic is developed for the problem and solved with the CPLEX solver on the AMPL platform to find a feasible solution. Results from the numerical implementation of model show the model is efficient and competitive with existing solid waste collection facility location models.

Keywords

Facility location problem Solid waste collection Lagrangian relaxation Lagrangian heuristic Subgradient optimization

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Notes

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