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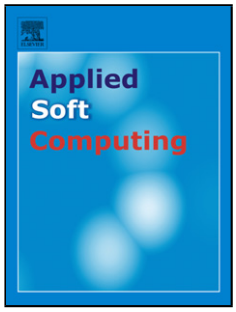

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Algorithms for the Multi-Objective Vehicle Routing Problem with Hard Time Windows and Stochastic Travel Time and Service Time

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Highlights

- The introduction of a new variant of the multiobjective stochastic routing problem.
- New algorithms with detailed discussion of its components.
- A statistical model to calculate the service level at customers.
- A number experiments demonstrate the effectiveness of the proposed algorithms.

ABSTRACT

This paper introduces a multi-objective vehicle routing problem with hard time windows and stochastic travel and service times. This problem has two practical objectives: minimizing the operational costs, and maximizing the service level. These objectives are usually conflicting. Thus, we follow a multi-objective approach, aiming to compute a set of Pareto-optimal alternatives with different trade-offs for a decision maker to choose from. We propose two algorithms (a Multi-Objective Memetic Algorithm and a Multi-Objective Iterated Local Search) and compare them to an evolutionary multi-objective optimizer from the literature. We also propose a modified statistical method for the service level calculation. Experiments

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