

A robust hybrid heuristic algorithm to solve multi-plant milk-run pickup problem with uncertain demand in automobile parts industry

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ABSTRACT

Considering the actual situation of China's automobile industry, this paper pioneers the discussion of the multi-factory milk run pickup problem with uncertain demand and frequency (MFMRPP-UDF). Considering the balance between inventory cost and distribution cost, a mixed-integer programming model was built for the problem, and converted into a robust optimization model by the Chernoff-Hoeffding theorem; then, the adaptive genetic algorithm (AGA) and local search (LS) were combined into a general hybrid heuristic algorithm (AGA-LS) to solve the problem. Then, the proposed algorithm was run 10 times and contrasted with the standard GA. The results show that the AGA-LS outperformed the standard GA in the reduction of the overall cost. This research provides important insights into the cost efficiency of inventory and delivery in the automobile parts industry.

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