

عنوان مقاله:

A Non-dominated Sorting Ant Colony Optimization Algorithm Approach to the Bi-objective Multi-vehicle Allocation of Customers to Distribution Centers

محل انتشار:

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نویسندگان:

Jafar Bagherinejad - Assistant Professor, Department of Industrial Engineering, Associate Professor of Industrial Engineering, Alzahra University, Tehran, Iran

Mina Deghani - MSc, Department of Industrial Engineering, Alzahra University, Tehran, Iran

خلاصه مقاله:

This paper proposes a mathematical model as the bi-objective capacitated multi-vehicle allocation of customers to distribution centers. Anevolutionary algorithm named non-dominated sorting ant colony optimization (NSACO) is used as the optimization tool for solving this problem. The proposed methodology is based on a new variant of ant colony optimization (ACO) specialized in multi-objective optimization problem. To help the decision maker to choose the best compromise solution from the Pareto front, the fuzzy-based mechanism is employed. For ensuring the robustness of the proposed method and giving a practical sense of this study, the computational results are compared with those obtained by NSGA-II. Results show that both NSACO and NSGA-II algorithms can yield an acceptable number of non-dominated solutions. In addition, the results show that while the distribution of solutions in the trade-off surface of both NSACO and NSGA-II algorithms do not differ significantly, NSACO algorithm is more efficient than NSGA-II with regard to optimality, convergence and the CPU time. Also, the results in some small cases are compared with those obtained by LP-metric method. The error percentages of objective functions in comparison to the LP-metric method are less than 2%. Furthermore, it can be seen that with increasing size of the problems, while the time of problem solving increases exponentially by using the LP-metric method, the running time of NSACO and NSGA-II are more .stable

کلمات کلیدی:

Bi-objective optimization, Capacitated allocation, Multi-vehicle, Distribution centers, Non-dominated sorting ant colony optimization, NSGA-II, LP- metric method

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