Waiting time duration-constrained Close-Open Mixed Vehicle Routing Problem with Semi Soft Time Window solved by Genetic algorithm and Tabu Search

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Abstract

The purpose of this study is a model base on the combination of close – VRP and open – VRP when a company used both the private and hired vehicles to serve customers with the variant of time window that is called semi soft time window. Moreover, main point of the model is that duration of waiting time due to early arrival to customer site has a limitation. Namely, in mentioned model, is defined a pre-anticipated time windows to duration of waiting time associated with each customer. First, we have presented COMVRP problem with semi soft time window and constraints related to the passed distance for each kind of vehicle, then waiting time has been given. Then, we considered the above problem without constraint of the passing distance and the results shown reduction in number of routs and also number of active vehicles required in the problem. To this purpose, a rigorous MILP mathematical model for the COMVRP problem taking into considering Semi Soft Time Window is introduced. The objective is to minimize the total transportation costs, or similarly to determine the optimal fleet composition and dimension following least cost vehicle routes. To find solutions to this problem, we have utilized two meta-heuristic algorithms, which consist of genetic algorithm and tabu search. Finally, our results show that genetic algorithm is performed well on the COMVRPSSTW.

Keywords
Location; Routing; Semi Soft Time Window; Tabu Search; Genetic Algorithm

BIOGRAPHY

Mehdi Seifbarghy is an Associate Professor and Vice Chancellor of Academic Affairs at Alzahra University, Tehran, IRAN. He earned B.S. in industrial Engineering from Shari University of Technology, Tehran, Masters in industrial Engineering from Sharif University of Technological, Tehran and PhD in Industrial Engineering from Sharif University of Technology, Tehran, Iran. He has published journal and conference papers. Dr Mehdi Seifbarghy's major domain is supply chain managemnet and facilty location.

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