A meta-heuristic approach for the Vehicle Routing Problem with occasional drivers

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Abstract

The Vehicle Routing Problem with Occasional Drivers (VRPOD) is a Vehicle Routing Problem (VRP) variant where a company has a fleet of capacitated identical vehicles but is able to hire a set of private or occasional drivers (ODs) who use their own vehicle to provide a single service of a customer. This service is given since the ODs obtain a compensation, and they are usually hired when the customer's location is not too far from the OD's location. This problem is very well connected to the current trends in logistics in low-density regions, where the cost of developing a fleet of vehicles could be high in relation to the actual volume of sales. The objective of this problem is to minimize the total cost, which is computed as the sum of the costs incurred by the routes performed by the fleet of vehicles and the compensation paid to the ODs. In this work we propose a meta-heuristic approach to tackle the VRPOD. This approach is able to find very good results in shorter computation times in relation to the state of the art.

Keywords: Occasional drivers, Meta, heuristics, Vehicle Routing Problem

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