

# Solving a distribution network design problem by combining ant colony systems and Lagrangian relaxation

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Distribution network design (DND) attempts to integrate tactical issues such as inventory policies and/or vehicle routing decisions with strategic ones such as the problem of locating facilities and allocate customers to such facilities. When inventory policy decision making is considered the problem is also known as inventory location modelling (ILM) problem. During the last two decades, mathematical programming as well as (meta-)heuristic approaches have been considered to address different DND problem. In this article we consider a hybrid algorithm of Lagrangian Relaxation and artificial ants to solve an ILM problem previously proposed in the literature. We use ACS to allocate customers to a subset of warehouses that is previously generated by the Lagrangian relaxation. Results show that the hybrid approach is quite competitive, obtaining near-optimal solutions within an acceptable time. © ICI Bucharest 2010 -2015.

Ant Colony Optimization

Distribution Network Design

Lagrangian Relaxation

Matheuristics