Hybrid fruit fly optimization algorithm for solving multi-compartment vehicle routing problem in intelligent logistics

Wang, C.L.③, Li, S.W.①,*

③School of Business, Shandong Normal University, Ji’nan, P.R. China

ABSTRACT

The purpose of this study was to tackle multi-compartment vehicle routing problem in intelligent logistics with the fruit fly optimization algorithm (FOA). A hybrid FOA (HFOA) integrated with three local search methods (2-opt, swap and insert) was adopted to solve the multi-compartment vehicle routing problem (MCRP) in intelligent logistics by applying discrete space optimization problems. The numerical experiments show that the HFOA algorithm has improved the performance for all proposed problems, including improving the total path length and enhancing the solution quality. The improvement rate in total path length shifts from 3.21% at 50 customers to 9.83% at 150 customers indicating that this HFOA is more effective in large-scale. The HFOA integrated with 2-opt, swap and insertion elevates the solution quality from 11.86% to 17.16% displaying the advantages. The effectiveness and stability of the proposed algorithm shed new light on the routing of MCV distribution problems in intelligent logistics.

© 2018 CPE, University of Maribor. All rights reserved.

ARTICLE INFO

Keywords:
Intelligent logistics;
Vehicle routing problem (VRP);
Multi-compartment vehicle (MCV);
Bionic optimization;
Fruit fly optimization algorithm (FOA)

*Corresponding author:
3472181435@qq.com
(Li, S.W.)

Article history:
Received 3 September 2018
Revised 4 December 2018
Accepted 7 December 2018

References


