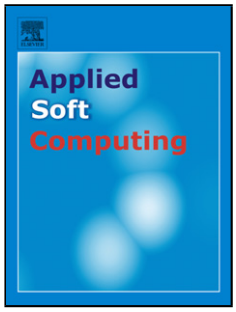

Title: A bi-level evolutionary optimization approach for integrated production and transportation scheduling

Author: Zhaoxia Guo Jing Yang S.Y.S. Leung Leyuan Shi

PII: S1568-4946(16)30040-0
DOI: http://dx.doi.org/doi:10.1016/j.asoc.2016.01.052
Reference: ASOC 3456

To appear in: *Applied Soft Computing*

Received date: 14-5-2015
Revised date: 24-10-2015
Accepted date: 31-1-2016

Please cite this article as: <doi>http://dx.doi.org/10.1016/j.asoc.2016.01.052</doi>

A bi-level evolutionary optimization approach for integrated production and transportation scheduling

Zhaoxia Guo [a *], Jing Yang [a], S.Y.S. Leung [b], Leyuan Shi [c]

[a] *Business School, Sichuan University, Chengdu 610065, PR China*
[b] *Institute of Textiles and Clothing,*
The Hong Kong Polytechnic University, Hong Kong, PR China
[c] *Department of Industrial and System Engineering,*
University of Wisconsin–Madison, Madison, WI 53706 USA
*Corresponding author. Tel.: +86 28 85417867; fax: +86 28 85415628.
E-mail address: zx.guo@alumni.polyu.edu.hk

Abstract

This paper investigates an integrated production and transportation scheduling (IPTS) problem which is formulated as a bi-level mixed integer nonlinear program. This problem considers distinct realistic features widely existing in make-to-order supply chains, namely unrelated parallel-machine production environment and product batch-based delivery. An evolution-strategy-based bi-level evolutionary optimization approach is developed to handle the IPTS problem by integrating a memetic algorithm and heuristic rules. The efficiency and effectiveness of the proposed approach is evaluated by numerical experiments based on industrial data and industrial-size problems. Experimental results demonstrate that the proposed approach can effectively solve the problem investigated.

Keywords: Supply chain scheduling; Production and distribution; Bi-level programming; Bi-level evolutionary algorithm