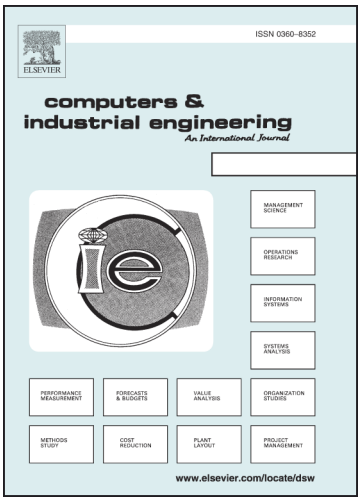

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PII: S0360-8352(18)30037-8
DOI: https://doi.org/10.1016/j.cie.2018.02.001
Reference: CAIE 5063

To appear in: *Computers & Industrial Engineering*

Received Date: 28 July 2017
Accepted Date: 2 February 2018

Please cite this article as: Vanhoucke, M., Coelho, J., A tool to test and validate algorithms for the resource-constrained project scheduling problem, *Computers & Industrial Engineering* (2018), doi: https://doi.org/10.1016/j.cie.2018.02.001

A tool to test and validate algorithms for the resource-constrained project scheduling problem

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February 24, 2018

Abstract

In a paper written by Vanhoucke et al. (2016), an overview of artificial and empirical project databases has been given for integrated project management and control. These databases are collections of the most well-known and widespread data instances available in literature for the construction of a baseline schedule, the analysis of schedule risk or the use for project control. The current paper serves as a follow-up study to further elaborate on the use of these data instances, and to give researchers an incentive to use these datasets for their research on the development and validation of new algorithms for project scheduling. Therefore, unlike the general focus of the previous paper on baseline scheduling, schedule risk analysis and project control, the focus on the current paper is restricted to resource-constrained project scheduling.

The intention of this follow-up overview is fourfold. First and foremost, a procedure is proposed to facilitate the reporting of best known solutions for the well-known single- and multi-mode resource-constrained project scheduling problem to minimize the project makespan. Secondly, the paper reports our best known solutions we obtained so far, and reflects on the network and resource parameters that increase the project complexity. In doing so, areas to focus on for future research are detected, and an attempt to define hard problem instances is given. Thirdly, a new dataset is presented for the resource-constrained project scheduling problem that is much more diverse in both the network topology and resource scarceness and will enable the future researcher to develop algorithms to solve a wider range of project problems. Finally, the paper also adds some links to tutorials and other relevant information to stimulate researchers to download the data and update best known solutions once available.

Keywords: Project data; Resource-constrained project scheduling; Best known solutions

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