

Accepted Manuscript

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PII: S1568-4946(18)30077-2
DOI: <https://doi.org/10.1016/j.asoc.2018.02.018>
Reference: ASOC 4710

To appear in: *Applied Soft Computing*

Received date: 5-9-2017
Revised date: 13-2-2018
Accepted date: 14-2-2018

Please cite this article as: Shaojun Lu, Xinbao Liu, Jun Pei, My T.Thai, Panos M.Pardalos, A hybrid ABC-TS algorithm for the unrelated parallel-batching machines scheduling problem with deteriorating jobs and maintenance activity, Applied Soft Computing Journal <https://doi.org/10.1016/j.asoc.2018.02.018>

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A hybrid ABC-TS algorithm for the unrelated parallel-batching machines scheduling problem with deteriorating jobs and maintenance activity

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Highlights

The highlights of this paper can be summarized as follows.

- An unrelated parallel machine scheduling problem with deteriorating maintenance activities, parallel-batching processing, and deteriorating jobs is proposed and a mixed integer programming model is formulated by considering the joint decision on jobs assignments, maintenance arrangements, jobs batching, and batches sequencing.
- We analyze a special case where all jobs have been assigned to machines. Based on the derived structural properties for the case, optimal algorithms are developed to minimize makespan.
- Due to the complexity of the studied problem, a hybrid ABC-TS algorithm combining ABC and TS is proposed to obtain a good solution in a reasonable time.

Abstract: This paper studies an unrelated parallel machine scheduling problem with deteriorating maintenance activities, parallel-batching processing, and deteriorating jobs. Practically, deteriorating maintenance activities mean that duration of maintenance activities will increase with its starting time. The objective is to make the joint decisions on jobs assignments, the maintenance arrangements, jobs batching, and batches sequencing on each machine to minimize

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