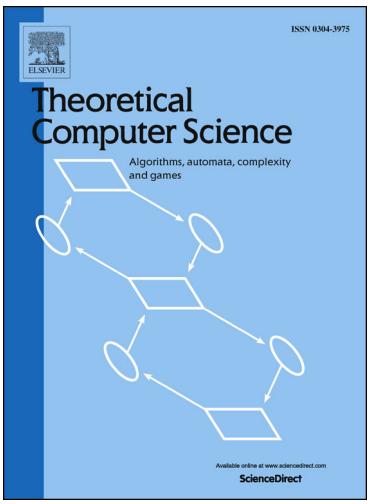
Accepted Manuscript



Two-agent parallel-machine scheduling with rejection

Dawei Li, Xiwen Lu

PII: S0304-3975(17)30652-7
DOI: http://dx.doi.org/10.1016/j.tcs.2017.09.004
Reference: TCS 11303

To appear in: *Theoretical Computer Science*

Received date: 9 May 2017
Revised date: 3 August 2017
Accepted date: 4 September 2017

Please cite this article in press as: D. Li, X. Lu, Two-agent parallel-machine scheduling with rejection, *Theoret. Comput. Sci.* (2017), http://dx.doi.org/10.1016/j.tcs.2017.09.004

Two-agent parallel-machine scheduling with rejection ☆

Dawei Li, Xiwen Lu*

School of Science, East China University of Science and Technology, Shanghai 200237, China.

Abstract

We study the two-agent scheduling with rejection on two parallel machines. There are two competing agents A and B with job families $\mathcal{J}^A$ and $\mathcal{J}^B$, respectively. A job in $\mathcal{J}^A$ or $\mathcal{J}^B$ is either rejected, in which case a rejection penalty will be incurred, or accepted and processed on one of the two parallel machines. The objective is to minimize the sum of the given objective function f^A of the accepted A-jobs and the total rejection penalty of the rejected A-jobs subject to an upper bound on the sum of the given objective function f^B of the accepted B-jobs and the total rejection penalty of the rejected B-jobs, where f^A and f^B are non-decreasing functions on the completion time of the accepted A-jobs and accepted B-jobs, respectively. We consider four scheduling problems associated with different combinations of the two agents' objective functions, $f^A = \sum C_j^A$ and $f^B \in \{C_{max}^B, L_{max}, \sum C_j^B, \sum w_j^B U_j^B\}$. When $(f^A, f^B) = (\sum C_j^A, C_{max}^B)$, we provide two pseudo-polynomial time algorithms and a fully polynomial-time approximation scheme ($FPTAS$). For the other problems, we give a pseudo-polynomial time algorithm, respectively.

Keywords: agent scheduling, parallel machines, rejection, pseudo-polynomial time algorithm, $FPTAS$

☆This research was supported by the National Natural Science Foundation of China under Grant No. 11371137.

*Corresponding author

Email address: xwlu@ecust.edu.cn(X.Lu) (Xiwen Lu)