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Investigating the recoverable robust single machine scheduling problem under interval uncertainty. (English) Zbl 07499200
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Summary: We investigate the recoverable robust single machine scheduling problem under interval uncertainty. In this setting, jobs have first-stage processing times $p$ and second-stage processing times $q$ and we aim to find a first-stage and second-stage schedule with a minimum combined sum of completion times, such that at least $\Delta$ jobs share the same position in both schedules.

We provide positive complexity results for some important special cases of this problem, as well as derive a 2-approximation algorithm to the full problem. Computational experiments examine the performance of an exact mixed-integer programming formulation and the approximation algorithm, and demonstrate the strength of a proposed polynomial time greedy heuristic.

MSC:
90B36 Stochastic scheduling theory in operations research
90C11 Mixed integer programming
68W25 Approximation algorithms
90C59 Approximation methods and heuristics in mathematical programming

Keywords:
scheduling; optimisation under uncertainty; recoverable robustness

Full Text: DOI

References:
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