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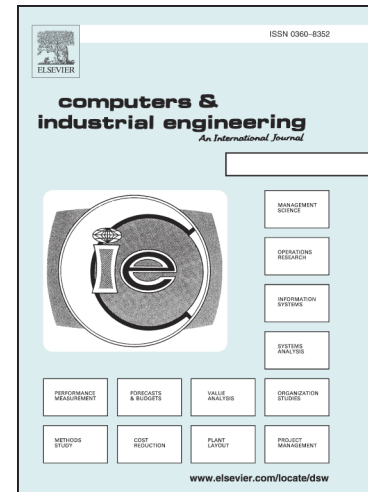
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An Improved Cuckoo Search Algorithm for Scheduling Jobs on Identical Parallel Machines

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Abstract

In this paper, we propose an improved cuckoo search algorithm (ICSA) to minimize makespan for the identical parallel-machine scheduling problem. Starting with an initial population of schedules generated by using the longest processing time (LPT) rule and the job-interchange mechanism, we select the best schedule from this population and then execute the proposed ICSA. For the ICSA, we first propose a heuristic approach using a modulus operator to transform a continuous position in CSA into discrete schedule of jobs for generating a new cuckoo by Levy flights. Next, we present a heuristic procedure based on the pairwise exchange neighborhood to produce smart cuckoos in the proposed ICSA. We then conduct exhaustive computational experimentation on a large number of randomly generated well-known benchmark problems to show that the proposed ICSA produces better solutions than the six state-of-the-art existing algorithms.

Keywords: Scheduling identical parallel machines; Makespan; Improved cuckoo search algorithm; Levy flights; Computational comparisons

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