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A Guided Local Search with Iterative Ejections of Bottleneck Operations for the Job Shop Scheduling Problem

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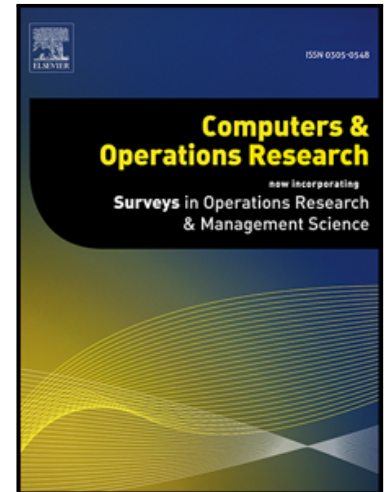
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Highlights

- The local search-based method that works in partial solution space is proposed for solving the job shop scheduling problem (JSP), where the current solution is represented as a feasible partial schedule.
- The best-so-far schedule is iteratively improved by solving the constraint satisfaction problem (CSP) defined as the original JSP with an additional constraint that the makespan is smaller than that of the best-so-far schedule.
- A dynamic programming-based algorithm efficiently enumerates possible local moves, creating feasible partial schedules under the constraint on the makespan.
- A tabu search algorithm is introduced as a re-optimization procedure.
- A mechanism similar to guided local search for selecting the next partial schedule from the neighborhood and random perturbation procedure improve the performance.

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