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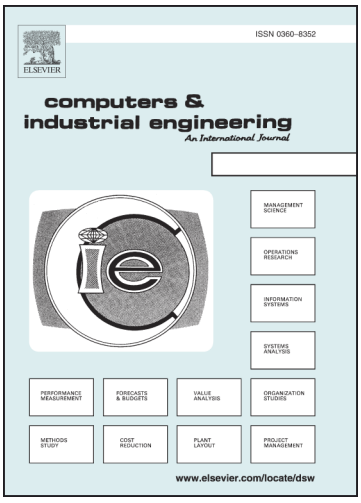

Cyclic Job Shop Robotic Cell Scheduling Problem: Ant Colony Optimization

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Cyclic Job Shop Robotic Cell Scheduling Problem; Ant Colony Optimization

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Abstract.
This paper deals with the cyclic job shop robotic cell scheduling problem with multiple robots. All the jobs are processed in order of their operations on multiple machines with standard processing times and the single gripper robots perform the transportation operations of jobs between the machines. Due to the special characteristics of the considered problem and NP-hard computational complexity, a metaheuristic algorithm based on ant colony optimization has been proposed. The proposed algorithm simultaneously determines the optimal height of jobs in the cyclic schedule, the robot assignments for transportation operations, and the optimal sequencing of the robots moves, which in return maximize the throughput rate. The efficiency of the proposed model is examined by a computational study on a set of randomly generated problem instances.

Keywords: **Scheduling; Robotic cell; Cyclic job shop; Multiple robots.**

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