Heuristic Approaches for Solving Two-dimensional Packing Problems

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ABSTRACT

Two-dimensional packing and cutting problems are a kind of common tasks encountered by industries, such as shoes making, textile, steel, clothing, etc. Although the cost of each industrial material is not the same, its cost occupies sizable proportion in the total cost. Therefore, finding an effective permutation method becomes one of the most important goals of them. In this study, we propose a simulated annealing (SA) based algorithm - IBH2, revised from the IBH algorithm appeared in the open literature for packing rectangle boxes with different sizes in material plates. IBH2 was developed using the placement policy of IBH, while adopting a new SA mechanism allowing the temperature increasing during the annealing process. In addition, we entered the concept of parallel processing and proposed a parallel simulated annealing (PSA). The performance of IBH2 and PSA were verified by running several benchmarking problems and the results were reported. Experimental results indicate that IBH2 and PSA are capable to offer robust and efficient solutions.

Keywords : packing problems, simulated annealing, parallel processing

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