Optimize 2D nesting problem for hollow sheets by simulated annealing

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ABSTRACT

A nesting problem can be completed by two processes; one is the determination of permutation for pieces sequences, the other one is applying placement algorithm for placing all pieces into the sheet. The two processes dominate the solution of the nesting problem. If the sequence of permutation and the placement rule of packing are up to standard, then the exact or optimum solutions can be found. But the problem is that we don ’ t know the sequence of permutation is adequate or not. Even the sequence is appropriate for the permutation, without a suitable placement algorithm the final results are also unacceptable. The objective of the two-dimensional optimal nesting problem is to determine the effective usage of the stock sheet under different considerations of pieces. Such make the material utilization rate is highest and the cost for material is therefore reduced. This research developed a new placement algorithm for pieces with gaps in nesting operations. Under this new placement algorithm, we will adopt the simulated annealing approach to optimal decision of hollow-sheets nesting systems.

Keywords : Automatic Nesting、Placement Algorithm、Simulated Annealing

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