A Rotatable Placement Algorithm to the Nesting Problem

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ABSTRACT

The problem about cutting, packing and nesting is a very important subject to the industry. A better full-automatic nesting system, not only can raise the efficiency and simplify manpower, but also increase competitiveness. Because the raw material takes the huge cost for such kind of companies. The objective of two-dimensional optimal nesting problem is to place the same or different pieces of the fixed quantity on the sheet in this paper. What we want to do is increase the rate of utility and decrease the waste of panel. Generally, determine the quality of the nesting results; it can briefly be divided into two factors: placement algorithm and permutation. Placement algorithm means the how to decide the positions where the pieces place into the sheet. And permutation is the placing sequence order of pieces. If the sequence of permutation is available and the placement rule also meets the demand of packing, then the exact or optimal solutions could be found. This research provides a new placement algorithm rule "Area-Decomposition" method. This combines the rotation function for each piece and genetic algorithm. A comparison of nesting with literature and commercial software shows the results. This research can really receive good results of nesting according to the demand of different situations.

Keywords : Automatic nesting ; Placement algorithm ; Genetic algorithm

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