# Application of Clustering Technology for Cell Formation Problem


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**ABSTRACT**

Cellular manufacturing system (CMS) is an application of group technology (GT). Due to its several advantages, this problem has been attracting attention from practitioners and researchers. Cell formation is one of the most important parts for the CMS. However, it is very difficult to obtain optimal solution for the cell formation problem in an acceptable amount of time due to its NP-Complete characteristics. The primary purpose of this research is to propose a heuristic method to solve the cell formation problem in an efficient manner. A simulated annealing-based heuristic algorithm is presented. The original problem is decomposed into two stages, the formation of part families and machine cells, respectively. When solving the subproblems above, a new similarity coefficient is proposed. The computational results show that this similarity coefficient helps forming the manufacturing cells efficiently and effectively. The design logic for the algorithm for the cell formation is also applied to the cell formation with alternative routings later in this thesis. Computational results obtained from the comparisons with those from the literature show the efficiency and efficacy of the proposed algorithm.



Keywords : Group technology ; Cell formation ; Simulated annealing


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