THE APPLICATION OF GENETIC ALGORITHM FOR CELLULAR MANUFACTURING SYSTEMS IN A FUZZY ENVIRONMENT

E-mail: 9127157@ mail.dyu.edu.tw

ABSTRACT

Due to advantages of simplification of manufacturing process, improvement of product quality, and reduction of set-up time and inventory, the Cellular Manufacturing system (CMS) has been widely investigated. However, CMS have been proven to be a non-polynomial (NP) problem. Thus, in this study a genetic-algorithm (GA) heuristic algorithm is borrowed to deal with the problem. In this research, a multiple-objective cell formation problem is investigated. In the tradition clustering method, it is assumed that one part only belongs to one family. However, this is not always the case. In the real problems, one part can belong to one family with a degree of membership. Therefore, the fuzzy set theory offers a possible solution for this situation. The aim of this research is to design a GA base algorithm to deal with the CMS problem in a fuzzy environment. Finally, the results are compared with existing algorithms.

Keywords : Group Technology ; Cell Formation Problem ; Fuzzy Theory ; Genetic Algorithm

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