عنوان مقاله:

A hybrid multi-objective algorithm to solve a cellular manufacturing scheduling problem with human resource allocation

محل انتشار:

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نویسندگان:

Vahid Razmjoei - *Department of Industrial Engineering, Mazandaran University of Science and Technology, Babol, Iran.*

Iraj Mahdavi - *Department of Industrial Engineering, Mazandaran University of Science and Technology, Babol, Iran.*

Selma Gutmen - *Faculty of Engineering Management, Poznan University of Technology, Poznan, Poland.*

خلاصه مقاله:

A Cellular Manufacturing System (CMS) is a suitable system for the economic manufacture of part families. Scheduling the manufacturing cells plays an effective role in successful implementation of the manufacturing system. Due to the fact that in the CMS, bottleneck machine and human resources are two important factors, which so far have not been studied simultaneously in a mathematical model, there should be a model to consider them. Therefore, this research develops a bi-objective model for CMS in a three-dimensional space of machine-part and human resources. The main objective is to minimize the maximum completion time of all tasks in the system and reduce the number of intercellular translocation based on bottleneck machines' motion and human resources. Due to the NP-hardness of the studied problem, applying the conventional solution methods is very time-consuming, and is impossible in large dimensions. Therefore, the use of metaheuristic methods will be useful. The accuracy of the proposed model is investigated using LINGO by solving a small example. Then, to solve the problem in larger dimensions, a hybrid Multi-Objective Tabu Search-Genetic Algorithm (MO-TS-GA) is designed and numerical results are reported for several examples.

کلمات کلیدی:

Cellular Manufacturing, scheduling, Multi-Objective Optimization, Human Resource Allocation

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