Mathematical and Heuristic Modelling in Flowshop Scheduling with Unrelated

洪正鴻、駱景堯

E-mail: 9221543@mail.dyu.edu.tw

ABSTRACT

In this research, a non-identical parallel machine flow shop scheduling problem of minimizing mean flow time is considered. In the past few years, in order to simplify the scheduling problem, most of research assumes setup and removal times are even negligible or part of the processing time. In this research, we look the setup, processing, and removal times as separatable, then take the sequence-independent setup and dependent removal times into account. To solve the addressed problem two different solving models are developed. First, a 0-1 integer programming model is constructed; however, the mathematical model is too time consuming to solve the medium or large size problem, thus, a simulated annealing based heuristic is proposed to get an near optimal schedule in a reasonable computation time. During the research, the parameters used in the heuristics that affect the solution quality and efficiency are analyzed and designed; then for the constructed heuristic, a good parameter setting is suggested. The experimental results are reported, and provided for the references for the further research.

Keywords : non-identical parallel machine ; flow shop ; setup time ; removal time

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