Application of Ant Colony Optimization in Open Shop Scheduling

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ABSTRACT

Machine scheduling is a central task in the production and control. In general it means the problem of scheduling job operations on a given number of available machines to minimize the production cost or satisfy the customers ’ requirements. The open shop scheduling problem is more complex than the other scheduling problems such as job shop and flow shop since the routing for the open shop scheduling problem is not fixed. 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 when deal with an open shop scheduling problem with the objective of minimizing the total job tardiness. Two heuristics based on the Ant Colony Optimization (ACO) are proposed for solving the addressed scheduling problem. Computational experiments show that the ACO2 heuristic performs well with respect to solution accuracy and efficiency.

Keywords : Open Shop Scheduling ; Independent Setup Times ; Dependent Removal Times ; Tardiness ; Ant Colony Optimization

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