

A Polynomial Genetic Based Algorithm to Minimize Maximum Lateness in a Two-Stage Flowshop with Setup Times

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Abstract—The two-stage flowshop scheduling problem with separate setup times to minimize maximum lateness is addressed in this paper. It is well known that this problem is strongly NP-hard and that there exists at least one optimal solution which is a permutation schedule. A polynomial hybrid genetic based algorithm is proposed to find an approximate solution to this problem. The proposed algorithm is compared with the existing heuristics in the literature. Computational experiments show that the proposed hybrid algorithm significantly outperforms the existing ones. More specifically, the computational complexity of the proposed algorithm and the best existing heuristic is the same as $O(n^3)$ while the average error of the best existing heuristic is 16 times that of proposed algorithm.

Keywords—Scheduling, Flowshop, Lateness, Setup times, Genetic algorithm

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