

A Hybrid Tabu Search Heuristic for the Two-Stage Assembly Scheduling Problem

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Abstract—In this paper, we address the two-stage assembly scheduling problem where there are m machines at the first stage and an assembly machine at the second stage. The objective is to schedule the jobs on the machines so that total completion time of all n jobs is minimized. Optimal solutions are obtained for two special cases. A simulated annealing heuristic, a tabu search heuristic, and a hybrid tabu search heuristic are proposed for the general case. The proposed heuristics are compared with the existing heuristics and shown to be more efficient. The computational analysis shows that the proposed hybrid tabu search heuristic improves the error rate by about 60 and 90 percent over tabu search and simulated annealing heuristics, respectively, where the CPU time of all the three heuristics is almost the same.

Keywords—Scheduling, Assembly flowshop, Total completion time, Simulated annealing, Tabu search

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