

# **Two-stage Meta-Heuristic Algorithm for Parallel Machine Scheduling with Additional Resource Input in Shipyard Manufacturing**

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## **Abstract**

Development of an efficient workspace scheduling algorithm for shipyard manufacturing has become more crucial as the modern smart factory technologies burgeon. Because the shipyard manufacturing is greatly sizable, a decision making on workspace scheduling is not a trivial mission. In particular, there are several considerations to schedule the block processing on the workspaces such as due date or resource limitation in the workspaces. In a practical sense for workspace scheduling, it is commonly used strategy to input additional resources into a workspace to shorten the total production time because a little curtailment of the total production time can provide a huge revenue in shipyard manufacturing. In this study, we tackle the workspace scheduling in shipyard manufacturing considering the additional resource input strategy. This problem can be considered as a class of the parallel machine scheduling problem. We introduce a mixed integer programming model for the addressed problem, and develop an efficient meta-heuristic algorithm. The proposed algorithm is composed of two stages: (i) a genetic algorithm enhanced by an ordering-based heuristic scheduling and (ii) a tabu-search algorithm for local search with considering additional resources input. The comprehensive computational study shows the efficiency of our proposed algorithm.

## **Keywords**

Parallel machine scheduling, Genetic algorithm, Tabu search, Shipyard manufacturing.

## **Biographies**

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