

## **Solving Process Planning, Weighted Apparent Tardiness Cost Dispatching, and Weighted Processing plus Weight Due-Date Assignment Simultaneously Using a Hybrid Search**

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**Abstract :** Process planning, scheduling, and due date assignment are three important manufacturing functions which are studied independently in literature. There are hundreds of works on IPPS and SWDDA problems but a few works on IPPSDDA problem. Integrating these three functions is very crucial due to the high relationship between them. Since the scheduling problem is in the NP-Hard problem class without any integration, an integrated problem is even harder to solve. This study focuses on the integration of these functions. Sum of weighted tardiness, earliness, and due date related costs are used as a penalty function. Random search and hybrid metaheuristics are used to solve the integrated problem. Marginal improvement in random search is very high in the early iterations and reduces enormously in later iterations. At that point directed search contribute to marginal improvement more than random search. In this study, random and genetic search methods are combined to find better solutions. Results show that overall performance becomes better as the integration level increases.

**Keywords :** process planning, genetic algorithm, hybrid search, random search, weighted due-date assignment, weighted scheduling

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