Research on Optimal Scheduling Algorithm of Manufacturing Process Time Quality Cost Based on Three-layer Workflow Decision

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Abstract

:Dynamically optimizing the time quality cost of the manufacturing process is an NP problem. This paper proposes a three-layer workflow scheduling model optimization algorithm Three-WSOA for this hot issue. The algorithm first establishes a three-layer isomorphic workflow decision-making model based on the partial order relationship of the manufacturing process, and secondly calculates the degree of freedom of each layer position node according to the proposed recognition rules, and then uses the serial reduction algorithm to process it from back to front to calculate the optimal configuration solution for each layer. Finally, forward scheduling is used to complete the multi-objective optimization of the entire three-layer workflow model. Simulation comparison found that the optimization algorithm can indeed achieve a dynamic balance between production quality and cost within a limited time, and it has a significant optimization effect compared to the traditional single-objective optimization algorithm. Therefore, the algorithm has certain feasibility and effectiveness.

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