Abstract

In most of the flow shop scheduling problem studies, the processing times of jobs are considered constant and deterministic. These assumptions obviously suggest a significant gap between theory and real-world production problems. In this study, the problem of flow shop scheduling with linear job deterioration is addressed. This problem is investigated in an uncertain environment, and fuzzy theory is applied to describe this situation. The considered objective is minimizing the sum of fuzzy earliness and tardiness penalties. The problem which is known to be NP-hard is compatible with the concepts of just-in-Time (JIT) production. To solve this complex problem, a novel integrating optimization approach based on fuzzy simulation and genetic algorithm is proposed. A set of random test problems with different structures are presented to evaluate the performance of this approach. The computational results demonstrate effectiveness of the proposed approach.

Index Terms

Computer Science

Algorithms
Keywords
Fuzzy simulation  genetic algorithm  flow shop scheduling  just-in-time  deteriorating jobs