

Multi-Subpopulation Genetic Algorithm with Estimation of Distribution Algorithm for Textile Batch Dyeing Scheduling Problem

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Abstract : Textile batch dyeing scheduling problem is complicated which includes batch formation, batch assignment on machines, batch sequencing with sequence-dependent setup time. Most manufacturers schedule their orders manually that are time consuming and inefficient. More power methods are needed to improve the solution. Motivated by the real needs, this study aims to propose approaches in which genetic algorithm is developed with multi-subpopulation and hybridised with estimation of distribution algorithm to solve the constructed problem for minimising the makespan. A heuristic algorithm is designed and embedded into the proposed algorithms to improve the ability to get out of the local optima. In addition, an empirical study is conducted in a textile company in Taiwan to validate the proposed approaches. The results have showed that proposed approaches are more efficient than simulated annealing algorithm.

Keywords : estimation of distribution algorithm, genetic algorithm, multi-subpopulation, scheduling, textile dyeing

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