

Minimizing makespan of a resource-constrained scheduling problem: A hybrid greedy and genetic algorithms

ABSTRACT

Resource-Constrained Project Scheduling Problem (RCPSP) is considered as an important project scheduling problem. However, increasing dimensions of a project, whether in number of activities or resource availability, cause unused resources through the planning horizon. Such phenomena may increase makespan of a project and also decline resource-usage efficiency. To solve this problem, many methods have been proposed before. In this article, an effective backward-forward search method (BFSM) is proposed using Greedy algorithm that is employed as a part of a hybrid with a two-stage genetic algorithm (BFSM-GA). The proposed method is explained using some related examples from literature and the results are then compared with a forward serial programming method. In addition, the performance of the proposed method is measured using a mathematical metric. Our findings show that the proposed approach can provide schedules with good quality for both small and large scale problems.

Keyword: Backward approach; Genetic algorithm; Makespan; Project scheduling; Resource-constrained