

ABSTRACT

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Multi-Objective Dynamic Optimization using Evolutionary Algorithms

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All contemporary practical problems, involve multiple conflicting objectives. Classical approaches, which were used in solving these problems, failed to produce multiple Pareto optimal solutions simultaneously. Evolutionary algorithms have emerged successful over classical approaches. A lot of studies on static multi-objective optimization have been cited in literature and the present study concentrates mainly on dynamic optimization. Time dependent problems are dealt by dynamic optimization algorithms.

Previous studies have mainly concentrated around dynamic single-objective optimization, but not dynamic multi-objective optimization (DMO). The present work suggests a naive approach to solve DMO problems. The algorithm is developed based on NSGA-II, which is the most commonly used algorithms in solving multi-objective optimization problems. In this proposed algorithm the term time is correlated with generation number, which helps in obtaining Pareto-optimal solutions for all time slots with a single run. The proposed algorithm is initially tested on standard test problems and further on a hydrothermal scheduling problem. The results obtained are better than the previously reported results. The present algorithm can also be used for on-line optimization like 'the optimal path planning of a walking robot'.