ABSTRACT

Decomposition-based constrained multiobjective evolutionary algorithms decompose a constrained multiobjective problem into a set of constrained single-objective subproblems. For each subproblem, the aggregation function and the overall constraint violation need to be minimized simultaneously, which however may conflict with each other during the evolutionary process. To solve this issue, this paper proposes a novel decomposition-based constrained multiobjective evolutionary algorithm with two types of weight vectors, respectively emphasizing convergence and diversity. The solutions associated to the convergence weight vectors are updated only considering the aggregation function in order to search the whole search space freely, while the ones associated to the diversity weight vectors are renewed by considering both the aggregation function and the overall constraint violation, which encourages to search around the feasible region found so far. Once the replacement of solutions does not happen for the diversity weight vectors in a period, the corresponding diversity weight vectors will be transferred to convergence one. Thereafter, all solutions will finally search around the feasible region, which helps to find more feasible or superior solutions. The proposed constraint handling technique can have a good balance to search the feasible and infeasible regions and show the promising performance, which is validated when tackling several constrained multi-objective problems.

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All are welcome!

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