

**Additional Exercises for Chapter 9 of the book: Coello
Coello, Carlos A.; Van Veldhuizen, David A. & Lamont,
Gary B. “Evolutionary Algorithms for Solving
Multi-Objective Problems”, Kluwer Academic
Publishers, New York, ISBN 0-3064-6762-3, May 2002.**

Exercises

1. Zhu and Leung [12] proposed an enhanced annealing genetic algorithm for multiobjective optimization. Analyze the way in which simulated annealing is hybridized with a genetic algorithm and compare it to other similar hybrids previously proposed in the literature (see for example [5]). Relate the Coverage Quotient used by this method with any of the metrics discussed in Chapter 4. Criticize this approach and outline some of its possible limitations/disadvantages.
2. There are several current proposals to extend particle swarm optimization to handle multiple objectives [8, 11, 9, 6, 3]. Compare and contrast these proposals in terms of the following issues:
 - Mechanism used to maintain diversity.
 - Methodology adopted to validate the algorithm proposed.
 - Use or not of elitism.
 - Mechanism used to generate nondominated solutions.
3. Khan et al. [7] proposed a hybridization of the Bayesian optimization algorithm (BOA) [10] with the NSGA-II [4]. Discuss the highlights of the algorithm and its main advantages and disadvantages. Would you consider this sort of algorithm particularly useful for certain type of applications? Discuss.
4. In Abbass [1], the Pareto Differential Evolution Algorithm previously proposed by the same author [2] is extended by introducing self-adaptation. Analyze this approach and the self-adaptation mechanism proposed. Do you see any possible limitations/disadvantages for this algorithm? Discuss.

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