A fuzzy genetic algorithm based on binary encoding for solving multidimensional

.

Abstract

The fundamental problem in genetic algorithms is premature convergence, and it is strongly related to the loss of genetic diversity of the population. This study aims at proposing some techniques to tackle the premature convergence by controlling the population diversity. Firstly, a sexual selection mechanism which utilizes the mate chromosome during selection is used. The second technique focuses on controlling the genetic parameters by applying the fuzzy logic controller. Computational experiments are conducted on the proposed techniques and the results are compared with other genetic operators, heuristics, and local search algorithms commonly used for solving multidimensional 0/1 knapsack problems published in the literature.