Abstract

For genetic algorithms (GAs) researchers look for optimal control parameters, such as population size or mutation rate. Early research was carried out using constant control parameters to find optimal parameter values for GA. The findings are only specific to the considered problem and therefore not suitable to be generalized. In more recent research, it was shown that the convergence rate can be increased by adaptable control parameters, e.g., mutation rate can be varied during the optimization run. Better optimization results have been achieved. It was shown how control parameters can be varied by self-adapting algorithms. The control parameters are coded within the chromosome to make them independent from the optimization problem. In newer researches, multi-chromosome representations have been used to decompose complex problems into a number of simpler sub-problems. Each part of the problem is represented by a separate chromosome with individual representation. Fitness values have been used to measure how good an individual fits with its environment (target criteria). This paper investigates the effects on GA performance or the optimization results by balancing control parameters to the fitness of a chromosome (chromosome fitness). Further it is investigated how mutation rate can be varied by chromosome fitness and whether this affects
the optimization performance of the GA or the optimization results.

References


Index Terms

Computer Science

Biomedical

Keywords

genetic algorithm  multi-chromosome  mutation rate  chromosome fitness  optimization