Abstract

Genetic algorithms (GAs) are multi-dimensional, blind heuristic search methods that involve complex interactions among parameters (such as population size, number of generations, GA
operators and operator probabilities). The question whether the quality of results obtained by GAs depend upon the values given to these parameters, is a matter of research interest. This work studies the problem of how changes in four GA parameters (population size, number of generations, crossover and mutation probabilities) affect GA performance from a practical standpoint. To examine the robustness of GA to these parameters, we have tested three groups of parameters and the interactions in each group (a) Crossover and mutation separately (b) Crossover combined with mutation together (c) Population size and number of generations. The results show that for simple problems mutation plays a momentous role, and for complex problems crossover is the key search operator. Based on our study we conclude that, complementary crossover and mutation probabilities combined with a reasonable population size is a reliable approach.

Reference


Index Terms

Computer Science
Evolutionary Computing
Key words

Genetic algorithm          control parameters

crossover

mutation

population sizing