1 Genetic Algorithm (GA)

1.1 Overview

1.2 Representation

1.3 Operations

1.3.1 Mutation

In biology, mutation is defined as a permanent alteration in the DNA sequence that makes up a gene. Mutations vary in size, sometimes just a small base pair of the gene is altered, while other times the mutation can alter large parts of a chromosome. There are many different forms of mutations. Sometimes it can simply mean changing the value of a nucleotide to its complement (nucleotieds are the building blocks of DNA and consists of the values A, C, G and T), other times it can mean insertion of extra nucleotides into the DNA, or deleting some of the nucleotides from the DNA, while other times again it can mean inversion of nucleotides [P. Compeau, 2014].

In genetic computation the mutation process is simplified. Since the search space only consist of strings of bits with constant size, a mutation in genetic computing simply consists of flipping of bits. In Figure 1 we have a bit string of size 8, where the 6th element is mutated from the value 1 to the value 0.
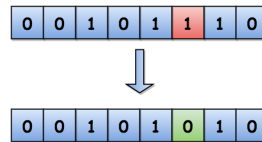

Figure 1: Mutation of a single bit. The bit in position 6 at the upper bit string has the value 1 before the mutation, while after mutation the value if flipped into 0.

1.3.2 Crossover

1.4 Algorithm

1.5 Summary