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FACULTY OF EGINEERING AND TECHNOLOGY

LECTURE -25

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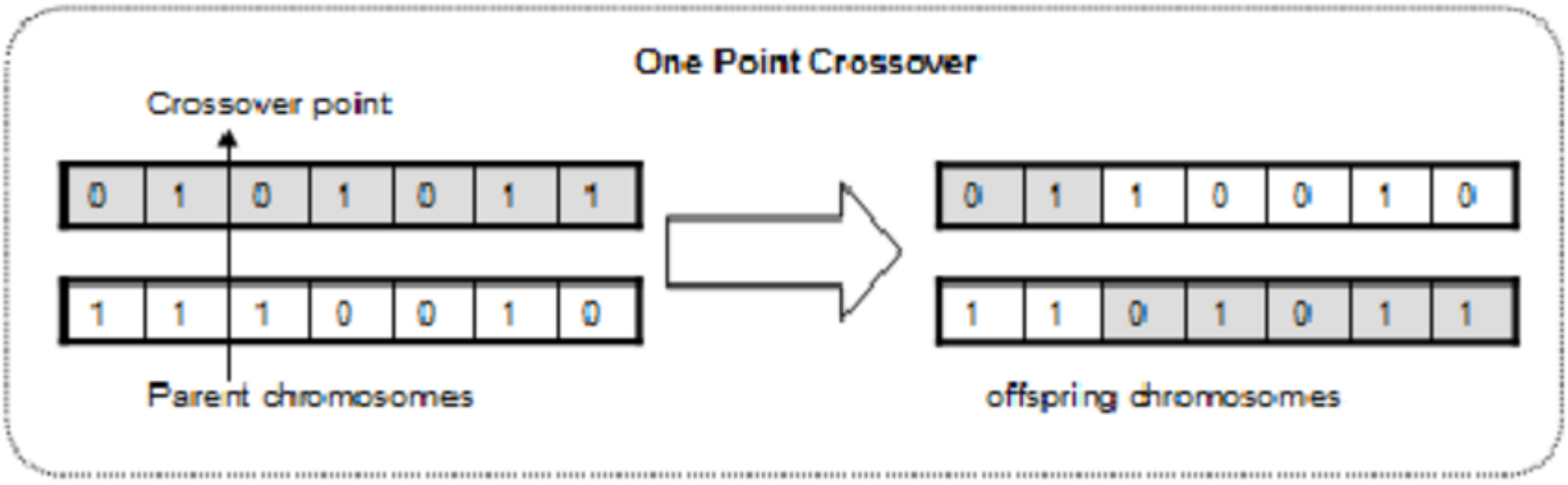
OUTLINE

- Cross over
- Types of crossover
- References

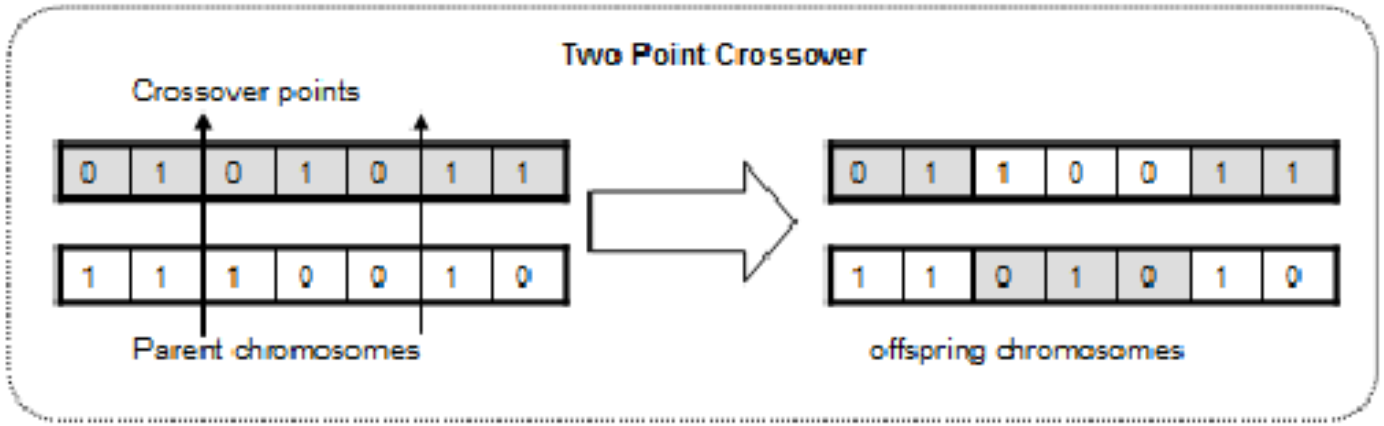
One Point Crossover

❑The traditional genetic algorithm uses single point crossover, where the two mating chromosomes are cut once at corresponding points and the sections after the cuts exchanged.



Two point crossover

- Apart from single point crossover, many different crossover algorithms have been devised, often involving more than one cut point.
- It should be noted that adding further crossover points reduces the performance of the GA.
- The problem with adding additional crossover points is that building blocks are more likely to be disrupted



Multi-Point Crossover (N-Point crossover)

The problem found in one point crossover may also occur in two point crossover.

In fact this problem can be generalized to each gene position in a chromosome.

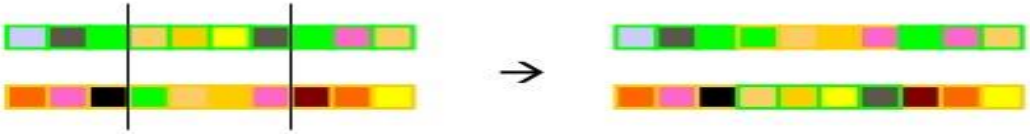
Genes that are close on a chromosome have more chance to be passed together to the offspring obtained through a N-points crossover.

Reproduction Operators comparison

- Single point crossover

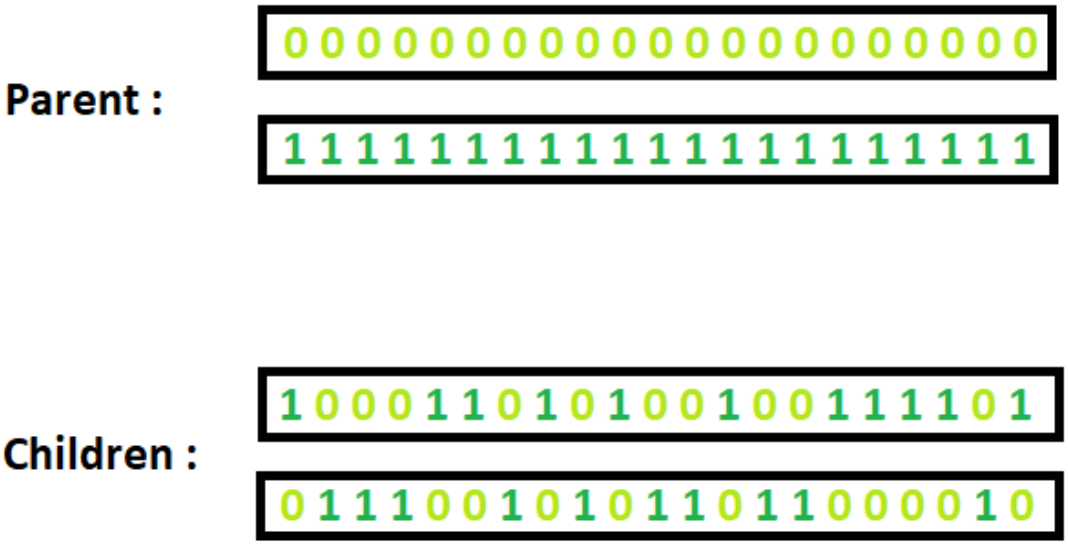
Cross point

- Two point crossover (Multi point crossover)



Uniform Crossover

Uniform crossover is quite different from the N-point crossover. Each gene in the offspring is created by copying the corresponding gene from one or the other parent chosen according to a random generated binary crossover mask of the same length as the chromosomes



Uniform Crossover

Arithmetic Crossover

- Arithmetic Crossover Chromosomes having real value or floating point representation undergo arithmetic crossover.
- This crossover creates a new allele at each gene position in the offspring.
- The value of new allele lies between the values of the parent alleles.
- The value of new alleles for offspring is computed using following equation:
- Offspring1 = w*parent1 + (1-w)*Parent2
- Offspring2= (1-w)*parent1 + w*Parent2
- Where w is constant weight factor that is used to compute new values.

REFERENCES

- https://www.google.com/search?q=one+point+crossover&tbm=isch&ved=2ahUKEwiT5figutbqAhWUen0KHcXZAKgQ2-cCegQIABAA&oq=one+point+cr&gs_lcp=CgNpbWcQARgAMgIIADICCAAyAggAMgYIABAFEB4yBggAEAgQHjIGCAAQCBAeMgYIABAIEB4yCAgAEAgQChAeMgYIABAIEB4yBggAEAgQHjoFCAAQsQM6BAgAEEM6BwgAELEDEENQu6oiWKDIImDl1iJoAHAAeACAAdQBiAHZEJIBBjAuMTEuMZgBAKABAaoBC2d3cy13aXotaW1nwAEB&sclient=img&ei=dLwSX5PbNJT19QPFs4PACg&bih=657&biw=1366#imgrc=SshxtUx6cu4E6M
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