



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



UNIT II: SAFETY DURING INSTALLATION OF PLANT AND EQUIPMENT

TOPIC: **ENCODING & FITNESS FUNCTION**





TOPIC OUTLINE

ENCODING / FITNESS FUNCTION

- Genetic Algorithm
- Benefits of Genetic Algorithm
- Fitness Function

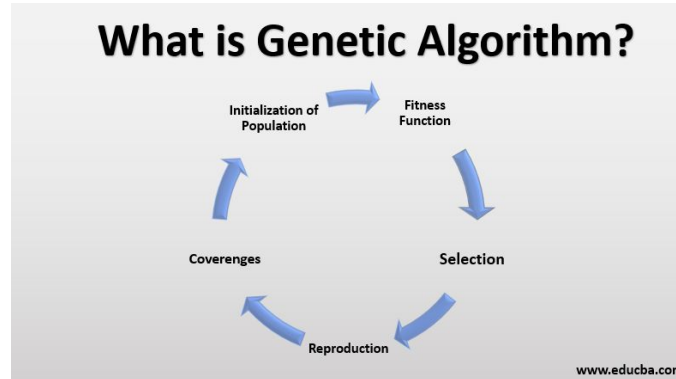




GENETIC ALGORITHM

DEFINITION

The genetic algorithm is a method for solving both constrained and unconstrained optimization problems that is based on natural selection, the process that drives biological evolution.





GENETIC ALGORITHM

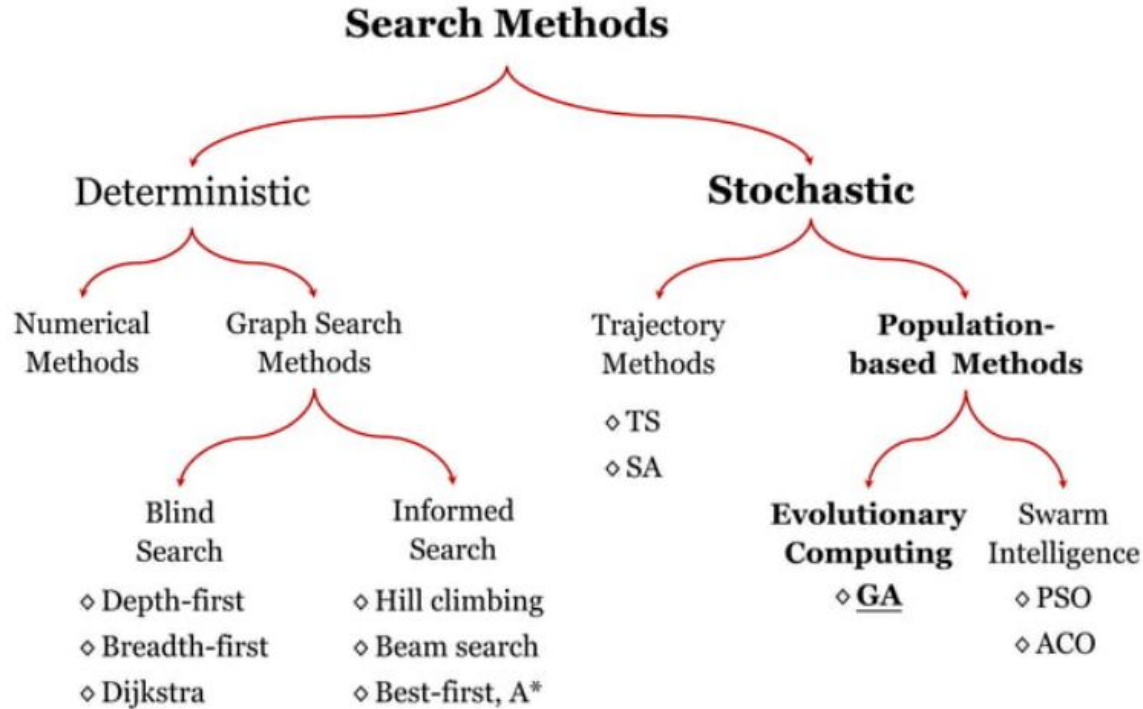
- Genetic Algorithms (GA) were introduced by **John Holland in 1975** (Holland, 1975).
- As with any evolutionary algorithm, GA rely on a metaphor of the Theory of Evolution.
- As suggested by Charles Darwin, a species evolves and adapts to its environment by means of variation and natural selection (Darwin, 1859).



John Holland
(1929-)
American scientist



GENETIC ALGORITHM





BENEFITS

- Concept is easy to understand
- Modular, separate from application
- Supports multi-objective optimization
- Good for "noisy" environments
- Always an answer; answer gets better with time
- Inherently parallel; easily distributed



FITNESS & FUNCTION

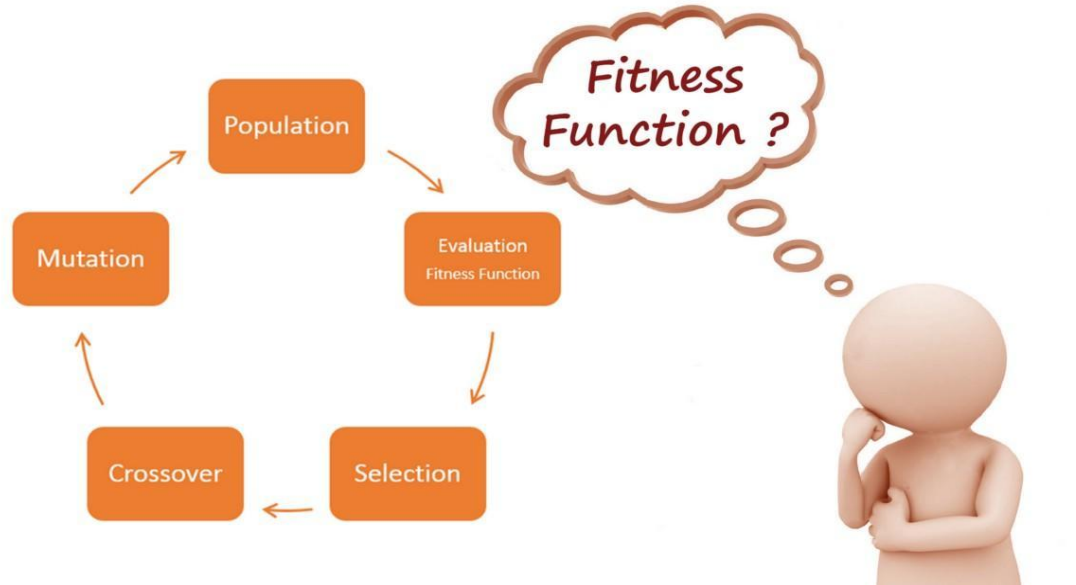


DEFINITION

- The fitness function simply defined is a function which takes a candidate solution to the problem as input and produces as output how “fit” or how “good” the solution is with respect to the problem in consideration.
- Calculation of fitness value is done repeatedly in a GA and therefore it should be sufficiently fast.
- A slow computation of the fitness value can adversely affect a GA and make it exceptionally slow.



FITNESS FUNCTION IN GENETIC ALGORITHM





*thank
you*