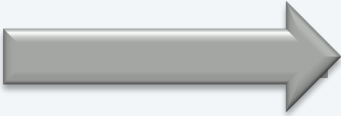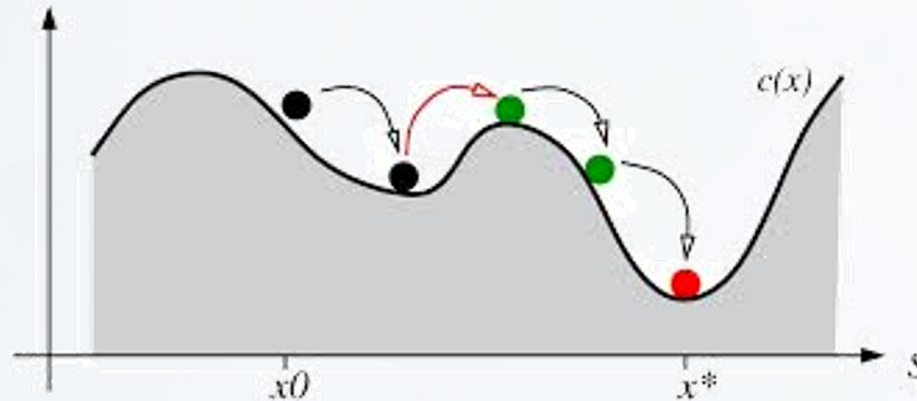# Local Search Algorithms

In this lecture:

- ❑ **Part 1:** What/Why Local Search Algorithms

- ❑ **Part 2:** Hill-Climbing Search

➡️ **Part 3: Simulated Annealing Search**

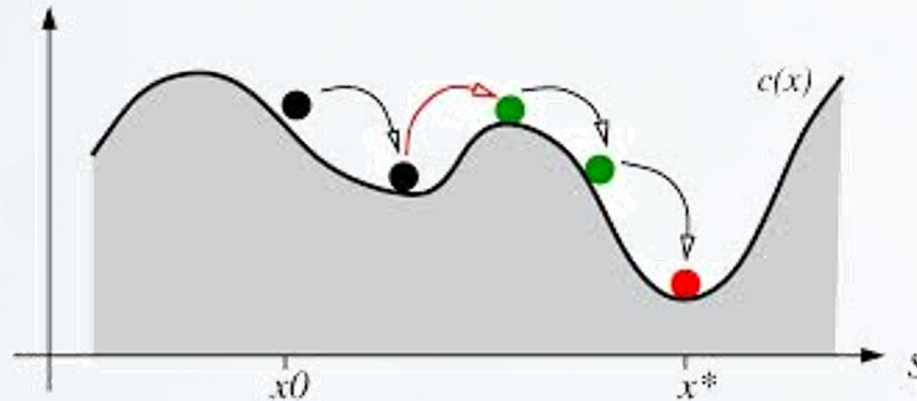- ❑ **Part 4:** Genetic Algorithms in nutshell

Simulated Annealing Search

To avoid being stuck in a local maxima, it tries randomly (using a <u>probability function)</u> to move to another state, if this new state is better it moves into it, otherwise try another move… and so on.

Simulated Annealing Search

Terminates when finding an acceptably good solution in a fixed amount of time, rather than the best possible solution.

Locating a good approximation to the global minimum of a given function in a large search space.

Widely used in VLSI layout, airline scheduling, etc.

Properties of Simulated Annealing Search

The problem with this approach is that the neighbors of a state are not guaranteed to contain any of the existing better solutions which means that failure to find a better solution among them does not guarantee that no better solution exists.

It will not get stuck to a local optimum.

If it runs for an infinite amount of time, the global optimum will be found.