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Glossary-5

1. **Anytime algorithm:** It is defined as an algorithm whose output quality gradually improves over time, so that it has a reasonable decision ready whenever it is interrupted. [1] Page: 1048
2. **Crossover:** These are defined as the points which are chosen at random from positions of each individual from which an offspring is generated. [2] Slide: 18
3. **Current state:** It is defined as the description of a state at a particular point of time. [1] page:121
4. **Decision problem:** It is defined as a complex problem which involves many trade-offs and a careful observation to obtain a decision. [1] Page: 65
5. **First Choice Hill Climbing:** It is defined as a technique which implements stochastic hill climbing by generating successors randomly until one is generated that is better than the current state. [1] Page:124
6. **Fitness function:** It is defined as a function which rates the states by an objective function. A fitness function returns higher values for better states. [1] Page: 127
7. **Genetic algorithm:** It is defined as a variant of stochastic beam search in which successor states are generated by combining two parent states rather than modifying a single state. [1] Page: 127
8. **Global optimum:** It is defined as the best optimal value in the entire search space. The global optimal solution has an objective value better than all other feasible solutions to a model. [2] Slide: 8
9. **Gradient ascent:** It is defined as maximizing an objective function. It means we make changes to current state to improve the quality. [2] Slide: 7
10. **Greedy Local search:** It is defined as a search technique which grabs a good neighbor state without thinking ahead about where to go next. [1] Page: 122
11. **Hill Climbing:**
    a. **Stochastic Hill climbing:** It is defined as a hill climbing technique which chooses at random from all the possible uphill moves. [1] Page: 124
    b. **First choice Hill climbing:** It is defined as a stochastic hill climbing technique which generates successors randomly until one is generated which is greater than the current state. [1] Page: 124
    c. **Random restart Hill climbing:** It is defined as a hill climbing technique which conducts a series of hill climbing searches from randomly generated initial states until a goal state is found. [1] Page: 124
12. **Local optimum:** It is defined as a solution which is optimal within a neighborhood set of possible solutions. [2] Slide: 8

13. **Local beam search:** It is defined as a search technique in which it keeps track of k best successors generated from a group of previous k best states until a goal state is obtained. [1] Page: 126
14. **Local search:** It is defined as a search algorithm which operates using a single current node and generally move on to neighbors of that node until a goal node is reached. It doesn't keep track of the path followed. [1] Page: 121
15. **Mutation:** It is defined as a change in the structure of a state. [1] Page: 127
16. **Objective Function:** It is defined as a function which determines the quality of a goal in an optimization problem. An objective function returns higher values for better states. [1] page: 121
17. **Optimization problem:** It is defined as a problem of finding the best solution from all the feasible solutions. This problem may require to either maximize or minimize an objective function. [1] Page: 121
18. **Plateau:** It is defined as a flat local optimum from which no uphill move exists or a shoulder. [1] Page: 123
19. **Random restart:** Sometimes a run appears not to be making progress. In this case we can start over from the top (random initial state) of the search tree, rather than trying to continue. This process is called Random restart. [1] Page: 124
20. **Random Walk:** It is defined as a technique which simply selects at random one of the available actions from the current state and proceeds. [1] Page: 124
21. **Sideway move:** It is defined as a technique which is used upon reaching a plateau, which states to jump somewhere else and restart the search. [3]
22. **Simulated annealing:** It is defined as a version of stochastic hill climbing where some downhill moves are allowed. These downhill moves are accepted early in the annealing schedule and then less often as time goes on. It is useful when stuck in a local optimum. [1] Page: 125
23. **State space Landscape:** It is defined as a landscape which has both location as defined by a state and elevation as defined by the value of heuristic cost function or an objective function. It represents the state space as a landscape. [1] Page: 121
24. **Stochastic beam search:** It is defined as a search technique which select k successors at random with the probability of choosing a given successor being an increasing function of its value rather than k best neighbors. [1] Page: 126

References:

[1]. Artificial Intelligence, A Modern Approach (AIMA), Third Edition, by Russell & Norvig.

[2]. Instructor Notes #7 by Professor Berthe Chouiery.

[3]. http://www.cs.iusb.edu/~danav/teach/c463/6_local_search.html