



# Difference between Informed and Uninformed Search in AI

Difficulty Level : Easy • Last Updated : 16 Feb, 2023

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## What is an Informed Search in AI?

algorithms have information on the goal state which helps in more efficient searching. This information is obtained by a function that estimates how close a state is to the goal state. Informed search in AI is a type of search algorithm that uses additional information to guide the search process, allowing for more efficient problem-solving compared to uninformed search algorithms. This information can be in the form of heuristics, estimates of cost, or other relevant data to prioritize which states to expand and explore. Examples of informed search algorithms include A\* search, Best-First search, and Greedy search.

**Example:** [Greedy Search](#) and Graph Search.

**Here are some key features of informed search algorithms in AI:**

- **Use of Heuristics** – informed search algorithms use heuristics, or additional information, to guide the search process and prioritize which nodes to expand.
- **More efficient** – informed search algorithms are designed to be more efficient than uninformed search algorithms, such as breadth-first search or depth-first search, by avoiding the exploration of unlikely paths and focusing on more promising ones.
- **Goal-directed** – informed search algorithms are goal-directed, meaning that they are designed to find a solution to a specific problem.
- **Cost-based** – informed search algorithms often use cost-based estimates to evaluate nodes, such as the estimated cost to reach the goal or the cost of a particular path.
- **Prioritization** – informed search algorithms prioritize which nodes to expand based on the additional information available, often leading to more efficient problem-solving.
- **Optimality** – informed search algorithms may guarantee an optimal solution if the heuristics used are admissible (never overestimating the actual cost) and consistent (the estimated cost is a lower bound on the actual cost).

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the problem definition. The plans to reach the goal state from the start state differ only by the order and length of actions. Uninformed search in AI refers to a type of search algorithm that does not use additional information to guide the search process. Instead, these algorithms explore the search space in a systematic, but blind, manner without considering the cost of reaching the goal or the likelihood of finding a solution. Examples of uninformed search algorithms include Breadth-First search (BFS), Depth-First search (DFS), and Depth-Limited search.

Uninformed search algorithms are often used as a starting point for more complex, informed search algorithms or as a way to explore the search space in simple problems. However, in complex problems with large search spaces, uninformed search algorithms may be inefficient and lead to an exponential increase in the number of states explored. **Examples:** [Depth First Search](#) and [Breadth-First Search](#).

### Here are some key features of uninformed search algorithms in AI:

- **Systematic exploration** – uninformed search algorithms explore the search space systematically, either by expanding all children of a node (e.g. BFS) or by exploring as deep as possible in a single path before backtracking (e.g. DFS).
- **No heuristics** – uninformed search algorithms do not use additional information, such as heuristics or cost estimates, to guide the search process.
- **Blind search** – uninformed search algorithms do not consider the cost of reaching the goal or the likelihood of finding a solution, leading to a blind search process.
- **Simple to implement** – uninformed search algorithms are often simple to implement and understand, making them a good starting point for more complex algorithms.
- **Inefficient in complex problems** – uninformed search algorithms can be inefficient in complex problems with large search spaces, leading to an exponential increase in the number of states explored.

Not guaranteed to find optimal solution – uninformed search algorithms do not guarantee an optimal solution, as they do not consider the cost of reaching the goal or other relevant information.