

## 9771 exp 5

### ⇒ 1 Time Complexity of A Algorithm\*

- A\* algorithm time complexity depends on the heuristic's quality and problem space size
- Generally expressed as  $O(b^d)$ , where  $b$  is the branching factor and  $d$  is the depth of the solution.
- Efficiency improves with a good heuristic function

### ⇒ 2 Limitations of A Algorithm\*

- Can be inefficient or incorrect with a poor heuristic
- Faces challenges with large or dynamic search spaces
- Memory-intensive for large space due to storing explored states.

### ⇒ 3 Comparison

A\* = Combines best features of greedy search and Dijkstra's algorithm. Depends on heuristic quality.

BFS: Guarantees shortest path in unweighted graphs. Memory intensive but suitable for small spaces.

DFS: Does not guarantee shortest path. Memory-efficient but may get stuck in infinite loops.

Dijkstra's: Finds shortest path in weighted graphs suitable for non-negative edge weights.