

**ARAB ACADEMY FOR SCIENCE, TECHNOLOGY AND MARITIME TRANSPORT (AASTMT)**

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Depth first and Breadth first research

Introduction to AI

This report was written to explain talk about and discuss the differences between depth first search algorithm(DFS) and breadth first search algorithm(BFS) and when to use each which of them.

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| Depth first search | Breadth first search |
| Finds shortest path using Queue | Stack is used in search |
| Better in searching for vertices closer to a given source. | Better when solutions are away from source. |
| In unweighted graph ,can be used to find single shortest path | possibly traversing through more edges from source to reach a goal vertex. |
| Same time complexity which is O(V+E) using adjacency list and O(V^2) when matrix is used. | |

Depth first search uses:

Depth first search applications and uses include networks analysis. topological sorting, scheduling problems, cycle detection in graphs, and solving puzzles with only one solution, like a maze or a sudoku puzzle.

Breadth first search uses:

Can be used in solving a lot of problems in graph theory like Copying garbage collection, Cheney's algorithm and also puzzles games like rubik’s cube.