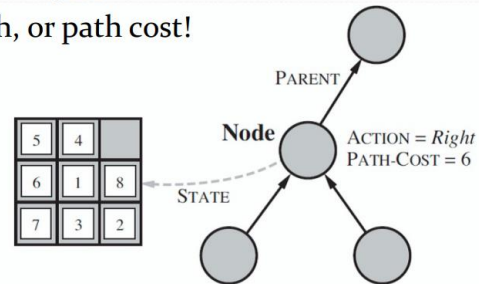


## States vs. Nodes

- **State** is a (representation of) a physical configuration.
- A **node** is a data structure constituting part of a search tree.
  - includes parent, children, depth, path cost  $g(x)$ .
- States do not have parents, children, depth, or path cost!



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## Quiz: DFS vs BFS

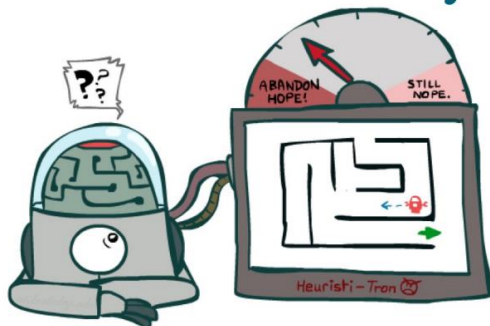
- When will BFS outperform DFS?

if we need speed time without looking to the space

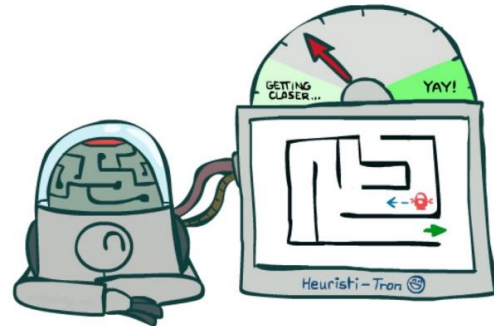
- When will DFS outperform BFS?

when we have limited memory DFS better than BFS

## Idea: Admissibility



Inadmissible (pessimistic) heuristics break optimality by trapping good plans on the fringe



Admissible (optimistic) heuristics slow down bad plans but never outweigh true costs

## UCS vs A\* Contours

- Uniform-cost expands equally in all “directions”
- A\* expands mainly toward the goal, but does hedge its bets to ensure optimality

