Which Node to Expand?

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Abstract

The purpose of this research is to produce a real-time heuristic search algorithm prototype that reasons carefully about which node is best to expand next. Traditionally, nodes are selected for expansion so that the f-value of the selected node is minimized.

However, in real-time search the goal is not to find the minimal path from the start to the goal, it is to find the best path possible, towards the goal, within an allotted time or number of expansions per move. Therefore, in real-time search the node on the frontier with the lowest f-value is not necessarily the best node to expand. The best node to expand in this instance is the node that increases confidence the most about the best action that the agent can immediately take.

I will implement a prototype algorithm that reasons more carefully about which node is best to expand next, and test it on some classic heuristic search benchmarks, as well as against traditional real-time search algorithms.