

Report Number -01: Heuristic Function

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Abstract—A Heuristics is a Function that estimates how close a state to a goal state. The heuristics or heuristics function differs from problem to problem and usually need to be designed to fit a certain problem. Most of the artificial intelligence problem can be described as follows: given a huge amount of information, data, and some constraints, tell me how to reach our goal state. In this case, the heuristics function tells us how close we are to the goal state.

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Index Terms—About Heuristic Function is the 8-puzzle problem in python.

I. INTRODUCTION

Heuristic is a function which is used in Informed Search, and it finds the most promising path. It takes the current state of the agent as its input and produces the estimation of how close agent is from the goal. The heuristic method, however, might not always give the best solution, but it guaranteed to find a good solution in reasonable time. Heuristic function estimates how close a state is to the goal. It is represented by $h(n)$, and it calculates the cost of an optimal path between the pair of states. The value of the heuristic function is always positive.

II. LITERATURE REVIEW

Heuristics in human decision-making was developed in the 1970s and the 1980s. The objective of a heuristic is to produce a solution in a reasonable time frame that is good enough for solving the problem at hand. This solution may not be the best of all the solutions to this problem, or it may simply

approximate the exact solution. But it is still valuable because finding it does not require a prohibitively long time.

Heuristics may produce results by themselves, or they may be used in conjunction with optimization algorithms to improve their efficiency. Results about hardness in theoretical computer science make heuristics the only viable option for a variety of complex optimization problems that need to be routinely solved in real-world applications.

III. PROPOSED METHODOLOGY

Current State $[[8,1,2],[3,6,4],[0,7,5]]$

Goal State $[[1,2,3],[8,0,4],[7,6,5]]$

IV. RESULT AND SOLVING PROBLEM

In this paper, i applied pattern classification techniques to solve a fundamental open problem in computer science that relates heuristic function accuracy and solution optimality. More specifically, in this paper, we have discussed the efficiency of using heuristic functions for optimization problems and resolved an open problem. The problem involves how the accuracy of a heuristic function relate to the quality of the corresponding solution obtained. The efficiency has been quantified by means of the probability of the heuristic function leading to the optimal solution. It is represented by $h(n)$. The value of this function is always positive.

The heuristics function is given as: $h(n) = h^*(n)$

1. up
2. Down.
3. Left.
4. Right.

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