

The best work^{*}

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Abstract. The abstract should briefly summarize the contents of the paper in 15–250 words.

Keywords: A* · PEA* · Search · heuristic · 8-puzzle.

1 Introduction

In this section, we will introduce the subject to be dealt with as well as a brief description of the rest of the sections of the work.

1.1 Description of the sections of the work

TODO

1.2 Description of the topic to be addressed

TODO

2 The 8-puzzle problem

TODO

3 The search algorithms

In this section, we will discuss about search algorithms, doing a distincion between uninformed and informed search algorithms. The uninformed algorithms that we will discuss are: Best First (BF). The informed algorithms that we will discuss are: A* and PEA*.

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3.1 Best first search (*BF*)

The uninformed search algorithms are those that do not use any information about the problem, they just expand the next node in the frontier. The most important thing that differentiates the various uninformed algorithms is the method they use to expand the next node in the frontier. Hereafter, we will treat the Best First (BF) search algorithm.

We will start with the "Best First" (BF) search algorithm [1], which is the basis of informed search algorithms, such as A^* . BF is based on the idea of expanding the node with the lowest cost. The cost of a node is calculated by the heuristic function $h(n)$ used.

The BF algorithm is as follows:

1. Expand the node with the lowest cost $h(n)$.
2. If the node is the goal, stop.
3. If not, add the node to the list of expanded nodes and expand its children.
4. Repeat from step 1.

You can see a more detailed description and a implementation of the algorithm in Russell's and Norvig's book [2].

3.2 A^*

The informed search algorithms are those that use the any information about the problem to expand the next node in the frontier.

The A^* algorithm is a variation of the BF algorithm. In A^* , use a function f to evaluate the nodes, this function in A^* is representate by $f^*(n)$ and this is the cost of the shortest path from initial to n conditional on passing through n . The function $f^*(n)$ (where n is any node) is defined as equation 1:

$$f^*(n) = g^*(n) + h^*(n) \quad (1)$$

Where $g^*(n)$ is the cost of the path from the initial node to the node n , and $h^*(n)$ is the heuristic function that estimates the cost of the path from the node n to the goal node.

The A^* algorithm is as follows:

1. Expand the node with the lowest cost $f^*(n)$.
2. If the node is the goal, stop.
3. If not, add the node to the list of expanded nodes and expand its children.
4. Repeat from step 1.

3.3 PEA^*

TODO

4 Application of the A* and PEA* algorithms to the 8-puzzle problem

TODO

5 Experimental study

TODO

6 Conclusions

TODO

7 DE AQUI PARA ABAJO = BASURA, LO DEJO DE EJEMPLO

Please note that the first paragraph of a section or subsection is not indented. The first paragraph that follows a table, figure, equation etc. does not need an indent, either.

Subsequent paragraphs, however, are indented.

Sample Heading (Third Level) Only two levels of headings should be numbered. Lower level headings remain unnumbered; they are formatted as run-in headings.

Sample Heading (Fourth Level) The contribution should contain no more than four levels of headings. Table 1 gives a summary of all heading levels.

Table 1. Table captions should be placed above the tables.

Heading level	Example	Font size and style
Title (centered)	Lecture Notes	14 point, bold
1st-level heading	1 Introduction	12 point, bold
2nd-level heading	2.1 Printing Area	10 point, bold
3rd-level heading	Run-in Heading in Bold. Text follows	10 point, bold
4th-level heading	<i>Lowest Level Heading.</i> Text follows	10 point, italic

Displayed equations are centered and set on a separate line.

$$x + y = z \tag{2}$$

Please try to avoid rasterized images for line-art diagrams and schemas. Whenever possible, use vector graphics instead (see Fig. 1).

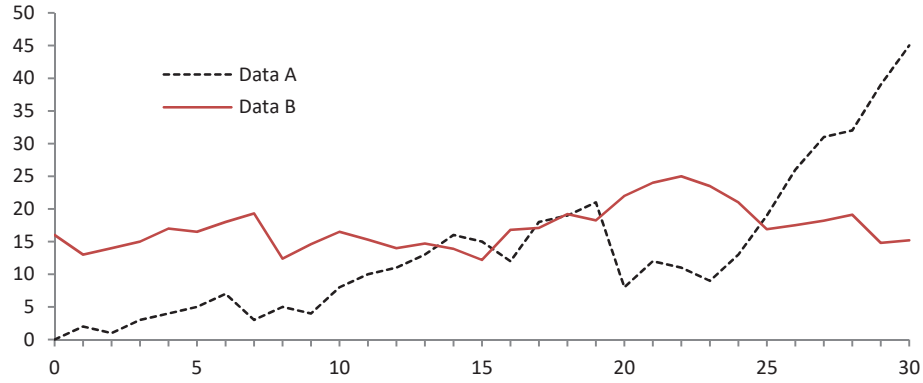


Fig. 1. A figure caption is always placed below the illustration. Please note that short captions are centered, while long ones are justified by the macro package automatically.

Theorem 1. *This is a sample theorem. The run-in heading is set in bold, while the following text appears in italics. Definitions, lemmas, propositions, and corollaries are styled the same way.*

Proof. Proofs, examples, and remarks have the initial word in italics, while the following text appears in normal font.

For citations of references, we prefer the use of square brackets and consecutive numbers. Citations using labels or the author/year convention are also acceptable. The following bibliography provides a sample reference list with entries for journal [?]

References

1. J. Pearl, "Heuristics : intelligent search strategies for computer problem solving," p. 382, 1984.
2. P. R. Norvig and S. A. Intelligence, *A modern approach*, vol. 90. 2002.