Scanner-Paper

A subtitle is purely optional

David Knöpp
University of Tübingen, Germany
david.knoepp@student.uni-tuebingen.de

ABSTRACT

Start with a structured abstract as a tiny text. That should **not** become your final version of an abstract without alteration.

An abstract (for a short paper like yours) should comprise about 100-150 words. Please, write a minimum of 80 and a maximum of 200 words.

KEYWORDS

Keywords, To, Increase, Discoverability

1 ENCODING A 3D BODY

To understand the scanner-algorithm, we must first understand the semantics of the code we are solving. In this section, we start with a three-dimensional body and encode it step by step, to end up with a set of integer-arrays.

Step one: Along the vertical axis, the body is divided into a finite set of two-dimensional slices. Each slice is viewed as constant in depth along the vertical axis. We then encode every slice independently of the others. All subsequent steps are applied to each slice individually. For the rest of the paper, we focus on one slice only for understandability.

Step two: The slice is discretized as a grid of $h \times w$ cells. A cell's state is binary-encoded: if the cell contains any portion of the body, the cell is encoded as `FULL`. Otherwise, it is encoded as `EMPTY`.

Step three: The grid of cells is now being measured for its depth along four directions:

- horizontal
- first diagonal (from bottom left to top right)
- vertical, and
- second diagonal (from bottom right to top left).

For each of those directions, the discretized body's depth is measured at all possible locations. For a grid of dimension $h \times w$, this yields four arrays with h, $h + w + 1$, w, and $h + w + 1$ entries respectively.

Those four arrays make up the encoded slice.

2 RECONSTRUCTING A SLICE

We are given two integer-arrays of lengths m and n, and two integer-arrays of lengths $m + n + 1$, all representing the depth of the object in the four possible directions. We want to reconstruct the discretized image from this data only. In this chapter, we explain the algorithmic approach we found to be most effective.

<say what is being done in this chapter lol. Like that we build the solution bottom up.>

2.1 Naive approach: Local Search

<Write about the standard local search that is also being used in the algorithm.>

2.2 Exploiting the chunk property

<Explain the chunk property and how to use exploit it>

2.3 Termination conditions

<The conditions that can be met to find out that we are done>

2.4 Putting it together?

<How all parts go together. And find a better title.>

3 ANALYSIS