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Video: Hidden surface removal using polygon area sorting.

Authors: Kevin Weiler and Peter Atherton

The paper presents an algorithm to remove hidden surfaces and hidden lines in a polygon. The approach of the algorithm is based on a two-dimensional polygon clipper which is sufficiently general to clip a concave polygon with holes to the borders of a concave polygon with holes. Many visible surface algorithms have been developed, each with unique characteristics and capabilities. There are many classification of algorithms based on their algorithm which include object space, image space and list-priority algorithms. The hidden surface algorithm selects a polygon shaped area in the x-y plane from the vantage point of the observer and solves the hidden surface problem in that area completely before going on to any other area. If there is an error in the initial depth sort, the algorithm may also be subdivided recursively. The algorithm proceeds from front to back across the transformed object space, producing portions of the final image along the way and temporarily reversing direction only when an initial depth sort error is detected. The copy of original polygon is used as a clipping polygon instead several pieces of its remainder. A clipping algorithm capable of clipping concave polygons with holes to the inside portion of a convex area has been described by Sutherland and Hodgman. The clipping process for the above algorithm requires five steps which are the following.

- The borders of the two polygons are compared for intersection.
- Contours which have no interactions are now processed.
- A clipping algorithm capable of clipping concave polygons with holes to the inside portion of a convex area has been described by Sutherland and Hodgman.
- The actual clipping is now performed.
- All holes on the holding lists are attached to the proper main contours.

The content of the research paper was candid and easy to understand. The authors covered all the required aspects of the algorithms. Division of algorithm into several steps made it easy to understand the algorithm. I can't say this is an area that interests, but since I am always fascinated by new algorithms, I must say that this algorithm is quite interesting and indulging.

I liked what I read in the paper, the implementation was clear and logical. Authors did a great job in covering all the important aspects of the algorithm. However, this algorithm would have been perfect, if the paper would have also presented the actual implementation or would have provided a pseudo code for the implementation.

I researched for a better paper on the same topic, but instead I found a ppt which presents the depth sorting in a more descriptive way and also provides some explanations for pseudo code for the hidden surface algorithm. [Link](#)