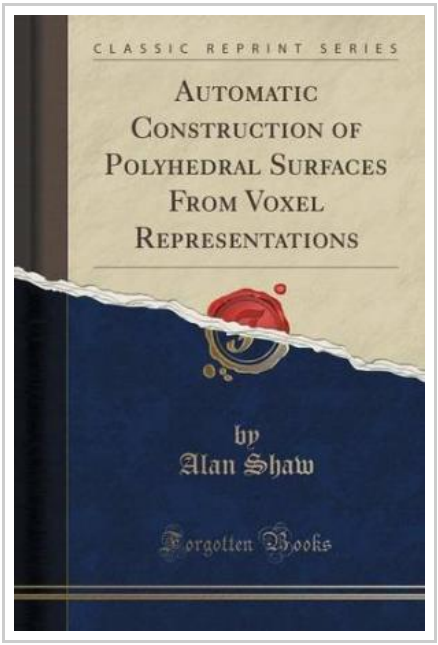

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Automatic Construction of Polyhedral Surfaces from Voxel Representations (Classic Reprint)

By Alan Shaw

Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from Automatic Construction of Polyhedral Surfaces From Voxel Representations Various applications require triangulations, or polyhedral representations, of surfaces which are represented as serial sections. Heuristic methods are in common use to triangulate such data. These methods work well on segments of generalized cylinder, i.e., runs of sections containing single loops, but they often fail when attempting to process highly convoluted surfaces. This is because the topology of the sections changes when a critical point of the surface is encountered. In this paper we use the equivalent of the full adjacency graph of the surface, provided by a voxel model, to classify the changes in topology of the sections of the surface, and thereby guide the triangulation process. For a voxel surface which is a discrete sampling of a smooth manifold in general position, we are able to exhaustively classify the small set of possible topological changes in the sections of the surface; we then deal with these cases exhaustively. To the best of our knowledge, this is the first description of an algorithm which can in...

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