

Finding Straight Skeleton of 3D Orthogonal Polyhedron: A Combinatorial Approach

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Abstract

A combinatorial algorithm is presented here to determine the straight skeleton on a given 3D orthogonal polyhedron in $O(n \log n)$ time, where n is the number of vertices in the 3D orthogonal polyhedron. A set of combinatorial rules is applied on the 3D orthogonal polyhedron to determine its straight skeleton. At each step a cuboid is considered on which one of the combinatorial rules is applied and a part of the 3D orthogonal polyhedron is discarded as per the reduction rule. When the whole 3D polyhedron is traversed the straight skeleton is obtained. The straight skeleton has many applications in shape analysis, shape matching, and shape retrieval.