

MESH REFINEMENT TECHNIQUE USING ADAPTIVE DELAUNAY TRIANGULATIONS

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Abstract

In this paper algorithm based on combination of h-refinement technique based upon longest edge bisection with Delaunay meshing has been proposed for computing optimal constrained triangulations. The time needed to add a new point to an existing mesh of any element number is the same. New nodes are self-adaptively generated and added to the current element which does not pass a check, using the algorithm presented in this paper. The mesh structure is improved by selecting the outside edges of the original element. Then two common elements to each selected edge, which form a quadrilateral, are checked to find the most satisfactory diagonal. Finally, nodal relaxation is employed to ensure that all elements are as close to equilateral triangles as possible.

Keywords : Adaptive mesh, Delaunay Triangulations, Finite element method, h-adaptivity, longest edge bisection.