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AN EFFICIENT ALGORITHM FOR LOCALLY FITTED 3D MESH GENERATION

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Abstract

A key step of the finite element method for numerical computation is mesh generation. One is given a domain (such as a polyhedron; more realistic versions of the problem allow curved domain boundaries) and must partition it into simple "elements" meeting in well-defined ways. Locally fitting domain is a powerful idea leading to methods which trade the simplicity of mesh generation against difficulties with the boundary conditions. We develop an automated 3D mesh generator produces meshes locally fitted to the boundary. Major reductions in required storage for meshing have been obtained. The computational complexity of mesh generator is the O (n), where n denotes the number of mesh points. Therefore this technique is suited for generating rather fine grids, quite efficiently.