

## Automatic Fast Tetrahedral Mesh Generation of Isosurfaces

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We present a method for generating 3-D unstructured tetrahedral meshes of solids whose boundary is defined by an isosurface. The method uses a background grid (body-centered-cubic (BCC) lattice) from which to build the final conforming 3-D mesh. The algorithm is fast, robust, and provides **practical** dihedral angle bounds for the output tetrahedral. The method makes basic use of simple 4-4 edge flips, and avoids the use of pre-defined refinement stencils (c.f. Labelle, Shewchuk 2007), and is easy to implement. Moreover, the only parameter in the method is the BCC lattice spacing.

Furthermore, if the surface has bounded curvature, and if the background grid is sufficiently fine, then the boundary of the output mesh is guaranteed to be a geometrically and topologically accurate approximation of the isosurface. Applications of the method range from surface flows, to modeling deformations, and anything that requires dynamic meshing (e.g. virtual surgery).