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Nonobtuse remeshing with a guaranteed angle bound

Abstract—Quality meshing is an important problem in geometric modeling, visualization and scientific computing. In this paper, we propose a 3D triangular remeshing method with a *guaranteed* angle bound of $[30^\circ, 90^\circ]$. Given a original 2-manifold, open or closed, a rough approximate mesh with the proposed angle bound is first generated. This is achieved by a novel extension of the classical marching cubes algorithm. Next, an iterative constrained optimization, along with constrained Laplacian smoothing, decimation, and subdivision, is performed to arrive at a close approximation of the original mesh.

Index Terms—Remeshing, non-obtuse meshes, marching cube, deform-to-fit.



1 Introduction

Efficient rendering, finite element analysis, and geometry processing such as compression, smoothing and deformation benefit form high quality meshes. Thus, a lot remeshing methods have been proposed to improve the mesh quality [1], both in terms of geometry [2], [3] and connectivity [4], [5]. It is desirable for the triangular mesh to have no small angles and/or no larger angles, depending on the targeted applications [6].

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2 CONCLUSION

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APPENDIX A PROOF OF THE FIRST ZONKLAR EQUATION

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APPENDIX B

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