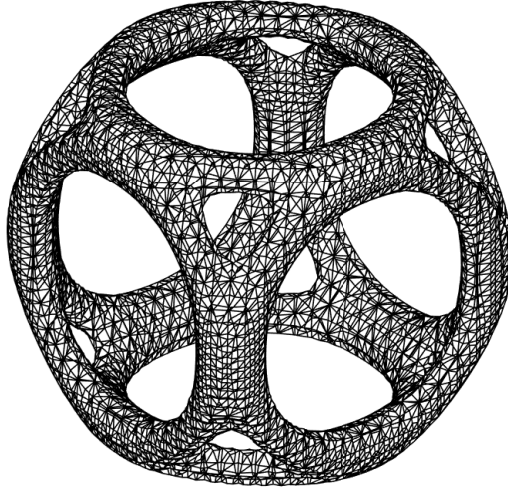# APPROXIMATION OF THE MEAN CURVATURE VECTOR

1. Background

Accurate computation of the mean curvature vector on a discrete surface plays an important role in computer graphics as well as in certain surface evolution problems. An accurate approximation of the mean curvature vector is for example essential for the approximation of the surface tension force in simulations of multiphase flow problems.

In this work we study a stabilized finite element method for approximation of the mean curvature vector. We will consider two approaches to construct the discrete surfaces:

- Standard meshed surfaces where the surface consists of shape regular triangles.
- Cut surfaces that are piecewise planar iso-levels of a piecewise linear distance function defined on a background mesh consisting of shape regular tetrahedra.

2. General task

Study the accuracy of the mean curvature vector on meshed and cut surfaces following the discretization proposed in [1]. Consider challenging surface geometries in 3D.

3. Supervisor

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References

[1] P. Hansbo, M. G. Larson, S. Zahedi, Stabilized Finite Element Approximation of the Mean Curvature Vector on Closed Surfaces, SIAM J. Num. Anal. 53, 1806-1832 (2015).