

Feature sensitive mesh processing

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Abstract

Many mesh processing algorithms assume the actual geometry of a triangle mesh to be characterized by the vertex positions only. From the manifold point of view however, triangle meshes have to be considered as continuous piecewise linear surfaces.

In sufficiently smooth and flat regions of the surface this observation doesn't really matter since any triangulation will yield a decent approximation to the underlying geometry. In the presence of sharply curved features however, this is not true.

Here, severe alias artifacts can affect the perceived surface quality and can lead to quite bad approximation behavior.

In my talk I will discuss several consequences of this observation and present recently developed algorithms for feature sensitive mesh generation and re-meshing techniques. I will report recent results in feature sensitive surface extraction from volume data, surface anti-aliasing by remeshing of blend regions in technical data sets, and diffusion based remeshing of triangle meshes.