Berliner Colloquium für wissenschaftliche Visualisierung

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Isotopic Approximation within a Tolerance Volume

Pierre Alliez

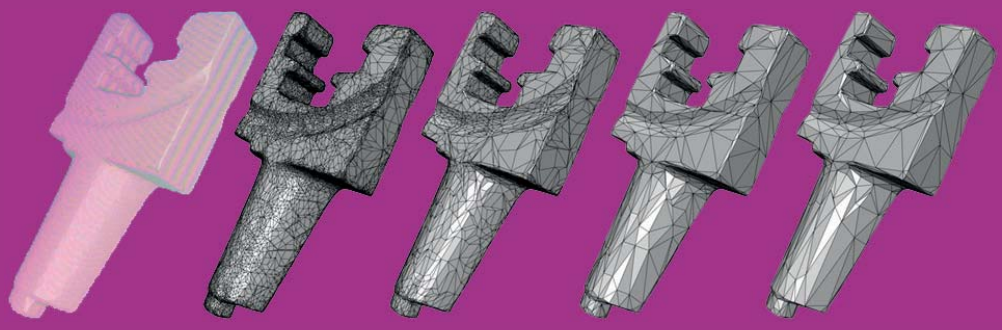
Inria Sophia-Antipolis – Mediterranee

Dienstag, 9. Februar 2016 um 16:15 Uhr

Zuse-Institut Berlin (ZIB), Takustraße 7, 14195 Berlin

Großer Hörsaal (Rundbau, Erdgeschoss)

In this talk I will discuss an algorithm that generates a surface triangle mesh from an input tolerance volume. The mesh is guaranteed to be within the tolerance, intersection free and topologically correct. A pliant meshing algorithm is used to capture the topology then discover the anisotropy in the input tolerance volume in order to generate a concise output. We first refine a 3D Delaunay triangulation over the tolerance volume while maintaining a piecewise-linear function on this triangulation, until an isosurface of this function matches the topology sought after. We then embed the isosurface into the 3D triangulation via mutual tessellation, and simplify it while preserving the topology. This approach extends to surfaces with boundaries and to non-manifold surfaces.
In the second part of the talk I will discuss the main ideas behind the proof of correct topology.



Joint work with David Cohen-Steiner and Manish Mandad.