

Institut für Geometrie

Gastvortrag

25.4.2013, 15:00

Seminarraum 2, Kopernikusgasse 24

Contour method for parameterizing canal surfaces

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A canal surface is the envelope of a 1-parameter set of spheres centered at the spine curve $m(t)$ and with the radii described by the function $r(t)$. Any canal surface given by rational $m(t)$ and $r(t)$ possesses a rational parameterization, and most of (exact or approximate) parameterization methods are based on a construction of a rational unit normal vector field guaranteeing rational offsets. We will study a condition which guarantees that a given canal surface has rational generalized contour curves (i.e., contour curves with respect to a given direction), which are later used for a straightforward computation of rational parameterizations of canal surfaces providing rational offsets. Our approach follows a construction of rational spatial MPH curves from the associated planar PH curves and gives it to the relation with the contour curves of canal surfaces given by their medial axis transforms. We also present a simple method for computing rational offset blends between two canal surfaces based on the contour method.

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