

Analysis of Geometric Subdivision Schemes

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Abstract

A geometric subdivision scheme is characterized by the fact that the refinement rules commute with similarities. If such a scheme is mapping linear polygons to linear polygons, as Sabin's circle preserving subdivision, $C^{1,\alpha}$ -regularity of the limit curve can be established automatically and rigorously by means of numerical computations. For the important subclass of locally linear schemes, $C^{2,\alpha}$ -regularity can be deduced from the joint spectral radius of a related linear scheme. If reproduction of linear polygons is not assumed, a convergence result similar to that of Dyn and Hormann can be proven, even if the scheme is not interpolatory. Also a condition for G^1 -continuity is given in terms of the decay of exterior angles.

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