

Institute für Mathematik, Geometrie und Statistik

Mathematisches Kolloquium

Freitag 15. Mai 2009, 15:00 (Kaffee um 14:30)

Hörsaal BE01, Steyrergasse 30

Linear and nonlinear subdivision schemes in geometric modeling

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Subdivision schemes are efficient computational methods for the design, representation and approximation of 2D and 3D curves, and of surfaces of arbitrary topology in 3D. Subdivision schemes generate curves/surfaces from discrete data by repeated refinements. While these methods are simple to implement, their analysis is rather complicated. The first part of the talk presents the “classical” case of linear subdivision schemes refining control points. It reviews mainly univariate schemes generating curves, their analysis, and their relation to the construction of wavelets. Several well known schemes are discussed. The second part of the talk presents three types of nonlinear subdivision schemes, which depend on the geometry of the data, and which are extensions of univariate linear schemes. The first two are schemes refining control points and generating curves. The last is a scheme refining curves in a geometry-dependent way, and generating surfaces.

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