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A hybrid non-stationary subdivision scheme based on triangulation.  (English) Zbl 07489948


Summary: During the past four decades, a lot of research works have been carried out for the construction of surfaces based on subdivision schemes. In contrast, non-stationary subdivision schemes have received much attention due to their efficiency and effectiveness in Geometric Modeling and Computer Aided Geometric Design (CAGD). In this paper, we propose a new hybrid subdivision scheme for triangular meshes. For this, we take the help of the directional convolution approach. The scheme is named hybrid since the subdivision masks of this scheme are uniquely obtained from the product of the normalized mask symbols of the stationary and non-stationary Courant elements. This scheme can be effectively applied to any 3D triangular meshes. We also study the convergence, smoothness analysis and exponential polynomial generation properties. The modeling potential of our subdivision scheme is demonstrated by a number of examples.

MSC:
65D07 Numerical computation using splines
65D17 Computer-aided design (modeling of curves and surfaces)

Keywords:
bivariate box spline; trigonometric B-splines; Courant element; arbitrary topology; directional convolution; convergence

Full Text: DOI

References:
[14] Jena, MK; Shunmugaraj, P.; Das, PC, A non-stationary subdivision scheme for generalizing trigonometric spline surfaces to


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