

POVZETEK

Subdivizija je ena od metod za konstrukcijo gladkih krivulj oz. ploskev. Osnovna naloga je sledeča. Podano je začetno zaporedje kontrolnih točk, definirano na regularni mreži, ki je v primeru krivulj kar množica celih števil na realni osi. V primeru ploskev pa imamo bodisi regularne kvadratne mreže bodisi regularne triangulacije. Subdivizijske sheme so pravila, s katerimi določimo nove kontrolne točke na bolj gosti mreži, ki ji dodamo še vse vmesne točke.

Subdivizijska shema je določena z masko $a = \{a_\alpha : \alpha \in \mathbb{Z}^s\}$ s kompaktnim nosilcem in s pravilom za nove kontrolne točke na k -tem nivoju $p_\alpha^k = \sum_{\beta \in \mathbb{Z}^s} a_{\alpha-2\beta} p_\beta^{k-1}$, kjer je $s = 1$ v primeru krivulj in $s = 2$ v primeru ploskev. Moj cilj je bil poiskati potrebne in zadostne pogoje na masko, ki zagotavljajo konvergenco subdivizijske sheme k limitni krivulji (ploskvi) in analizirati gladkost teh limit. Posebej sem predstavila še interpolacijske subdivizijske sheme ter t.i. shemo "Metuljček".

ABSTRACT

Subdivision schemes are efficient computational methods for the design of curves and surfaces. Subdivision schemes are refinement rules, which refine data by inserting values corresponding to intermediate points, using linear combinations of neighbouring points. Refinements of regular meshes have been considered, which in the univariate case (subdivision for curve generation) are uniformly distributed points on the real line, and in the bivariate case (subdivision for surface generation) are either square grids or regular triangulations.

Subdivision scheme is determined by a mask of compact support $a = \{a_\alpha : \alpha \in \mathbb{Z}^s\}$ and by the rule of the form $p_\alpha^k = \sum_{\beta \in \mathbb{Z}^s} a_{\alpha-2\beta} p_\beta^{k-1}$, where $s = 1$ in case of curves and $s = 2$ in case of surfaces. The aim was to give conditions on the mask which guarantee the convergence of the subdivision scheme to a limit curve (surface), and to analyze the smoothness of this limit. Interpolatory subdivision schemes have been outlined too, and the "Butterfly" scheme has been presented.

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Ključne besede: subdivizija, subdivizijska shema, subdivizijska maska, kontrolne točke, subdivizijsko pravilo, osnovna limitna funkcija, B - zleпки

Key words: subdivision, subdivision schemes, mask, control points, refinement rule, refinable function, B - splines

Literatura

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