Journal of Quality Measurement and Analysis *JQMA 5(1) 2009, 65-74*
Jurnal Pengukuran Kualiti dan Analisis

RATIONAL GENERALISED BALL FUNCTIONS FOR CONVEX INTERPOLATING CURVES

(Fungsi Ball Teritlak Nisbah untuk Lengkung Interpolasi Cembung)

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ABSTRACT

A curve interpolation scheme based on the generalised Ball basis functions which has been developed by the authors uses piecewise rational quintic generalised Ball functions to visualise scientific data. In fact, this scheme uses a rational generalised Ball with quartic numerator and linear denominator, which involves shape parameters. In this paper, we discuss an interpolation problem for convex data. The two parameters, in the description of the rational interpolant, have been constrained to preserve the shape of the data. We examine the convexity-preserving properties of this rational interpolant to a given data set. Based on the analysis, the degree of smoothness attained is C^1. Some numerical results are presented.

Keywords: Visualisation; interpolation; rational generalised Ball; convexity; continuity

ABSTRAK

Satu skema interpolasi lengkung berdasarkan fungsi asas Ball teritlak yang telah dibina oleh pengarang menggunakan fungsi Ball teritlak kuintik nisbah cebis demi cebis untuk menampakkan data saintifik. Malahan, skema ini sebenarnya menggunakan fungsi nisbah Ball teritlak dengan pengangka kuartik dan penyebut linear, yang melibatkan parameter bentuk. Dalam makalah ini, masalah interpolasi untuk data cembung dibincang. Dua parameter, dalam pentakrifan penginterpolasi nisbah, telah dikekang untuk mengekalkan bentuk data. Sifat kekal-cembung penginterpolasi nisbah ini diteliti terhadap set data yang diberikan. Berdasarkan analisis, darjah kelicinan yang dicapai adalah C^1. Beberapa keputusan berangka dipersembahkan.

Kata kunci: Penampakan; interpolasi; Ball teritlak nisbah; kecembungan; keselanjaran

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