

Convexity preserving using GC1 cubic ball interpolation

Abstract

This paper studies the use of cubic Ball interpolation for convexity preserving of scalar data. The parameter r_i in the description of the cubic interpolant are subject to be constrained to guarantee the existence of the convex cubic interpolant for convex data. The sufficient condition for the convexity-preserving of cubic Ball interpolant will be developed. The degree smoothness attained is GC1. With suitable choices of the shape parameter, r_i the method under consideration is reducing to GC1 quadratic spline shape preserving interpolation for convex data. Several numerical results including with the comparison with existing scheme will be presented to test the applicability of the proposed cubic interpolant.