On Shape Preserving Thin Plate Splines

Boris I. Kvasov

Abstract. This paper addresses a new approach in solving the problem of shape preserving spline interpolation. Based on the formulation of the latter problem as a differential multipoint boundary value problem for thin plate tension spline we consider its finite-difference approximation. The resulting system of linear equations can be efficiently solved by successive over-relaxation (SOR) iterative method or using finite-difference schemes in fractional steps. We consider the basic computational aspects and illustrate the main advantages of this original approach.