SOME ESTIMATES OF INTERVAL INTERPOLATION HERMITE SPLINES

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For interval-valued functions of one interval variable a problem of Hermite interpolation is stated as the generalization of a classical interpolation problem for real-variable functions.

It is shown that the problem has a solution in the class of interval Hermite spline-functions of $2n-1$ degree of $n-1$ order of smoothness, where the smoothness is understood in the sense of formal derivative: the restriction of the spline with respect to interval parameters belongs to the C^{n-1} class.

Study is made of some internal and approximation properties of interval Hermite splines for arbitrary nonuniform grids of interpolated data. Accurate estimates have been obtained for the width of various classes of interval splines. The property of monotonicity relative to inclusion for interval spline-interpolants has been established.

Error estimates for approximating the functions of various classes of smoothness by interval Hermite splines have been obtained. In a number of cases these estimates are the best possible in these classes. Hence the convergence of interpolation process and the possibility of function approximation to a given accuracy take place.

A special part is played in the problems of approximation theory by the Hausdorff metric, the concept of which can also be generalized for interval numbers and functions. For certain classes of interval Hermite splines some estimations of approximation in Hausdorff metric have been obtained.

The results obtained have a number of generalizations and applications.

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