Dryanov, Dimiter; Haußmann, Werner; Petrov, Petar

Best one-sided $L^1$-approximation by $B^{2,1}$-blending functions. (English) [Zbl 0991.41018]


This work presents a solution for an extension to a two-dimensional setting of the following classical problem. Let $f^{(n+1)} \geq 0$. Let $I$ be the closed interval $[-1,1]$, and let $P_n$ be the polynomials of degree not exceeding $n$. The one-dimensional problem is to characterize the best one-sided $L_1$ approximation to $f$ from $P_n$. In this paper $I$ is replaced with $I^2$; $P_n$ is replaced with the blended functions,

$$B_{m,n} = \{ b : \frac{\delta^{m+n}}{\delta x^m \delta y^n} b = 0 \};$$

and $f$ is replaced with a function $g$ such that

$$\frac{\delta^{m+n}}{\delta x^m \delta y^n} g \geq 0.$$

This two-dimensional setting is complicated by the fact that $B_{m,n}$ is infinite dimensional. The authors contribute the first solution of this general setting by proving a characterization for the case, $m = 2$ and $n = 1$.

For the entire collection see [Zbl 0972.00049].

Reviewer: Daniel Wulbert (La Jolla)

MSC:

41A50 Best approximation, Chebyshev systems

Cited in 3 Documents