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On min-max affine approximants of convex or concave real-valued functions from $\mathbb{R}^k$, Chebyshev equioscillation and graphics. (English) [Zbl 07451979]


Summary: We study min-max affine approximants of a continuous convex or concave function $f : \Delta \subseteq \mathbb{R}^k \rightarrow \mathbb{R}$, where $\Delta$ is a convex compact subset of $\mathbb{R}^k$. In the case when $\Delta$ is a simplex, we prove that there is a vertical translate of the supporting hyperplane in $\mathbb{R}^{k+1}$ of the graph of $f$ at the vertices which is the unique best affine approximant to $f$ on $\Delta$. For $k = 1$, this result provides an extension of the Chebyshev equioscillation theorem for linear approximants. Our result has interesting connections to the computer graphics problem of rapid rendering of projective transformations.

For the entire collection see [Zbl 1470.42002].

MSC:

$41$-$XX$ Approximations and expansions

$51$-$XX$ Geometry

Full Text: DOI

References:


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