
Zbl 767.41004

Erdős, Paul; Halász, G.

On the arithmetic means of Lagrange interpolation. (In English)

Approximation theory, Proc. Conf., Kecskemét/Hung. 1990, Colloq. Math. Soc. János Bolyai 58, 263-274 (1991).

[For the entire collection see Zbl 746.00075.]

For $f:[-1,+1]\to\mathbb{R}$ let $p_n(x)=L_n(f;x)$ be the Lagrange interpolation polynomial on the roots of the Chebyshev polynomial of degree n: $p_n(\cos\vartheta_{m,n})=f(\cos\vartheta_{m,n})$, $m=1,\dots,n$, where $\vartheta_{m,n}=(2m-1)\pi/2n$. The authors prove the following theorem: Given a sequence $\lambda(N)\to 0$ however slowly, one can construct a continuous function $f_0(x)$ such that for almost all $x\in[-1,+1]$, $(1/N)|\sum_{n=1}^N L_n(f_0;x)|\geq\lambda(N)\log\log N$, for infinitely many N.

This result corrects an oversight in the proof of a result of the first author and *G. Grünwald* [Studia Math. 7, 82-95 (1938; Zbl 018.11804)], that the analogue of Fejér's classical result about the arithmetic means of Fourier series is false for interpolation.

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