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Ditzian - Totik moduli of smoothness, spline systems and generalized Hölder spaces

For a class of step-weight functions φ on $[0,1]$ satisfying $\varphi(x) \sim x^{\beta}(1-x)^{\gamma}$ with $\beta, \gamma \geq 0$, the relation between Ditzian - Totik moduli of smoothness with the step-weight φ and the best approximation by splines with the knots uniformly distributed according to the measure with density $1/\varphi(x)$ is discussed. The direct and converse results are presented. Applications of these results are presented: characterization of generalized Hölder spaces (with the Hölder condition given by Ditzian - Totik modulus of smoothness) in terms of divided differences of functions at the suitable knots, and the relation of the best approximation by algebraic polynomials and by splines with knots corresponding to $\varphi(x) = \sqrt{x(1-x)}$.

Reference: A. Kamont, *Weighted moduli of smoothness and spline spaces*, submitted to Journal of Approximation Theory.