Bounding the Lebesgue constant for a rational Hermite interpolant at equidistant nodes

Emiliano Cirillo
Università della Svizzera italiana
cirile@usi.ch

It is well known that for the interpolation of a function at equidistant points, the family of rational interpolants introduced by Floater and Hormann compares favourably with classical polynomials. Indeed, recent results show that in this setting, the Lebesgue constant associated to these interpolants grows logarithmically, in contrast to the exponential growth experienced by polynomials. A similar behaviour occurs for polynomial interpolants in the case of Hermite interpolation, where also the first derivatives of the interpolant are prescribed at the nodes. In this talk we show how to extend the construction of Floater and Hormann to the Hermite setting and study the growth of the Lebesgue constant for this rational interpolant, which turns out to be bounded from above by a constant for any number of interpolation nodes. Our numerical examples not only confirm this remarkable result, but also show that the Lebesgue function is equal to 1, except close to the end points of the interpolation interval, where it behaves like 2^{2d}, with d being the degree of the locally interpolating polynomials in the construction of Floater and Hormann.

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