

Efficient implementation of bivariate interpolation and cubature at Padua points

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Abstract

A new set of points for polynomial interpolation on the square $[-1, 1]^2$, called “Padua points”, was introduced and experimentally studied. It has been proved that they are unisolvent in the full polynomial space and that they give the first known example of non tensor-product optimal interpolation in two variables, since their Lebesgue constant has minimal order of growth of $\mathcal{O}((\log n)^2)$.

In this talk we present a stable and efficient Fortran BLAS-based implementation and a new Matlab FFT-based implementation of the Lagrange interpolation formula and cubature at the Padua points.