Near-optimal interpolation and quadrature in two variables: the Padua points

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Abstract
The Padua points are the first known example of optimal points for total degree polynomial interpolation in two variables, with a Lebesgue constant increasing like \( \log^2 \) of the degree; cf. \([1, 2, 3]\). Moreover, they generate a nontensorial Clenshaw-Curtis-like cubature formula, which turns out to be competitive with the tensorial Gauss-Legendre formula and even with the few known minimal formulas in the square, on integrands that are not “too regular”; cf. \([4]\). Such a behavior is analogous to that of the univariate Clenshaw-Curtis formula; cf. \([5]\). We present a survey about properties, software implementations and applications of interpolation and numerical cubature at the Padua points.

References

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