
Issues in Multivariate Polynomial Interpolation

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While univariate polynomial interpolation has been a basic tool of scientific computing for hundreds of years, multivariate polynomial interpolation is much less understood. Already the question from which polynomial space to choose an interpolant to given data has no obvious answer.

The talk recalls, in some detail, two answers to this basic question, including the “least interpolant” of Amos Ron and the speaker which, among other nice properties, is degree-reducing, then seeks some remedy for the resulting discontinuity of the interpolant as a function of the interpolation sites, then addresses the problem of a suitable representation of the interpolation error and the nature of possible limits of interpolants as some of the interpolation sites coalesce.

The second part of the talk is devoted to a more traditional setting, the complementary problem of finding correct or, better yet, good interpolation sites for a given polynomial space, chiefly the space $\Pi_{<k}$ of all polynomials whose degree is less than some k , and ends with a particular recipe for good interpolation sites in the square, the Padua points.

References: <http://pages.cs.wisc.edu/~deboor/multiint/>