Bézier form of dual bivariate Bernstein polynomials

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Abstract Dual Bernstein polynomials of one or two variables have proved to be very useful in obtaining Bézier form of the L^2-solution of the problem of best polynomial approximation of Bézier curve or surface. In this connection, the Bézier coefficients of dual Bernstein polynomials are to be evaluated at a reasonable cost. In this paper, a set of recurrence relations satisfied by the Bézier coefficients of dual bivariate Bernstein polynomials is derived and an efficient algorithm for evaluation of these coefficients is proposed. Applications of this result to some approximation problems of Computer Aided Geometric Design (CAGD) are discussed.

Key words Dual bivariate Bernstein basis · Bézier coefficients · Bivariate Jacobi polynomials · Bivariate Hahn polynomials

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