

Monomial Form Approach to Rectangular Surface Modeling

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Abstract : Geometric modeling plays an important role in the constructions and manufacturing of curve, surface and solid modeling. Their algorithms are critically important not only in the automobile, ship and aircraft manufacturing business, but are also absolutely necessary in a wide variety of modern applications, e.g., robotics, optimization, computer vision, data analytics and visualization. The calculation and display of geometric objects can be accomplished by these six techniques: Polynomial basis, Recursive, Iterative, Coefficient matrix, Polar form approach and Pyramidal algorithms. In this research, the coefficient matrix (simply called monomial form approach) will be used to model polynomial rectangular patches, i.e., Said-Ball, Wang-Ball, DP, Dejdumrong and NB1 surfaces. Some examples of the monomial forms for these surface modeling are illustrated in many aspects, e.g., construction, derivatives, model transformation, degree elevation and degree reduction.

Keywords : monomial forms, rectangular surfaces, CAGD curves, monomial matrix applications

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