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Bivariate Barycentric-Coordinate Berstein-Bezier Polynomial & C1 Quadratic Vertex Spline

Rui Jiang
Illinois Wesleyan University

Tian-Xiao He, Faculty Advisor
Illinois Wesleyan University

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By using simplex, a local coordinate system is defined, referred to barycentric coordinates. Based on barycentric coordinates, Berstein-Bezier polynomial is defined, which brings a great convenience to present the smoothness of vertex spline. In this poster, we will show how to obtain Berstein-Bezier polynomial of simplex in barycentric coordinates, and to present the proof of necessary and sufficient conditions of smoothness of vertex spline. By giving two examples, we will show two different subdivisions of simplexes into 6 and 12 triangles respectively so that Bezier nets of C¹ quadratic finite elements can be shown.