

A direct and local method for computing polynomial Pythagorean-normal patches with global G^1 continuity

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We will present a direct and local construction for polynomial G^1 spline surfaces with a piece-wise Pythagorean normal (PN) vector field. A key advantage of our method is that the constructed splines possess exact piece-wise rational offsets without any need for reparametrisations, which in turn means that no trimming procedure in the parameter domain is necessary. The spline surface consists of locally constructed triangular PN macro-elements, each of which is completely local and capable of matching boundary data consisting of three points with associated normal vectors. The collection of the macro-elements forms a G^1 -continuous spline surface. The designed method will be demonstrated on several examples.

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