

Fractional Cone and Hex Splines

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We introduce an extension of cone splines and box splines to fractional and complex orders. These new families of multivariate splines are defined in the Fourier domain along certain s -directional meshes and include as special cases the three-directional box splines and hex splines considered earlier in the literature. These cone and hex splines of fractional and complex order also generalize the univariate fractional and complex B-splines. Explicit time domain representations are derived for these splines on 3-directional meshes and some properties of these two multivariate spline families such as recurrence, decay and refinement presented. It is also shown that a bivariate hex spline and its integer lattice translates form a Riesz basis of its linear span.