

Numerical Quadrature Over Smooth Closed Surfaces

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The numerical approximation of definite integrals, or quadrature, often involves the construction of an interpolant of the integrand and its subsequent integration. In the case of one dimension it is natural to rely on polynomial interpolants. However, their extension to two or more dimensions can be costly and unstable. An efficient method for computing surface integrals on the sphere is detailed in the literature (Reeger and Fornberg, *Studies in Applied Mathematics*, 2016). The method uses local radial basis function (RBF) interpolation to reduce computational complexity when generating quadrature weights for any given node set. This talk discusses the generalization of this method to arbitrary smooth closed surfaces.