

Simple advances in partition of unity enriched methods and implicit surface representation

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ABSTRACT

This talk present recent advances in partition of unity methods. It is organised in two parts. We start by discussing numerical integration techniques proposed in S. Natarajan's PhD thesis and later developed during his post-doc. We then present methods to address the deterioration of the conditioning number and blending. Finally, applications to various areas of solid mechanics within an enriched FEM and enriched EFG context (plates, gradient elasticity, etc.) and discuss a posteriori error estimation.

The second part of the talk presents new advances in implicit surface definition from parametric surfaces. First, a multi-level set method to represent arbitrary solids known by parametric representations, including sharp edges and corners is presented. Second, advances in (enriched) isogeometric and maximum entropy interpolants are discussed. In particular, a 3D isogeometric boundary element method based on T-splines is described.