

Generation of curved high-order meshes via quality-based optimization

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ABSTRACT

In the last two decades unstructured high-order methods have attracted the attention of computational mechanics community since they allow obtaining highly accurate approximations to the solution of a PDE on complex domains. However, their adoption for practical applications has been hampered by technical challenges such as the generation of suitable 3D curved meshes. High-order meshes are usually generated using *a posteriori* approaches [1, 2, 3, 4] whereby the final mesh is obtained by modifying an initial linear mesh.

In this talk we present our quality-based framework to validate and generate curved high-order meshes. On the one hand, we define quality and distortion measures for high-order elements to check the validity of a mesh [4, 5]. On the other hand, we show an optimization of a regularized version of the distortion measure to generate high-order curved meshes composed of valid and high-quality elements [6, 7].

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