



Mesh Deformation Based on Fully Stressed Design: The Method and Two-Dimensional Examples (Paperback)

By -

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.Mesh deformation in response to redefined boundary geometry is a frequently encountered task in shape optimization and analysis of fluid-structure interaction. We propose a simple and concise method for deforming meshes defined with three-node triangular or four-node tetrahedral elements. The mesh deformation method is suitable for large boundary movement. The approach requires two consecutive linear elastic finite-element analyses of an isotropic continuum using a prescribed displacement at the mesh boundaries. The first analysis is performed with homogeneous elastic property and the second with inhomogeneous elastic property. The fully stressed design is employed with a vanishing Poisson's ratio and a proposed form of equivalent strain (modified Tresca equivalent strain) to calculate, from the strain result of the first analysis, the element-specific Young's modulus for the second analysis. The theoretical aspect of the proposed method, its convenient numerical implementation using a typical linear elastic finite-element code in conjunction with very minor extra coding for data processing, and results for examples of large deformation of two-dimensional meshes are presented in this paper. KEY WORDS: Mesh deformation, shape optimization, fluid-structure...

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