

## MESH UPDATE TECHNIQUES: ROBUSTNESS AND EFFICIENCY

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### Abstract:

In this paper a new mesh update technique is proposed and a numerical study for this method and other three spring analogy methods is conducted. For the solution of the moving mesh update problem a PCG-based algorithm is used, combined with the proposed mesh update technique. The PCG-based algorithm is also applied to the other three mesh update techniques, namely the torsional, the semi-torsional and the ball-vertex spring analogy schemes. The robustness of these four spring analogy methods is evaluated and their computational efficiencies are compared in 3D benchmark problems, including the AGARD wing 445.6. It is demonstrated that the ortho-semi-torsional spring analogy concept, in conjunction with a PCG type method for the solution of fictitious elasticity problems, provides robustness for substantially distorted meshes and computational efficiency for large scale problems.

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