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Abstracts of Short Communications and Posters

Section:

17. Control Theory and Optimization

1991 MS Classification: 90C31, 73K40, 73K05
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Shape optimisation of geometrically nonlinear 3d beams and shells.
A shape gradient has been derived from continuous equations associated with 3d beams and shells [1]. By means of an adjoint equation, we compute an accurate shape gradient and we minimise differentiable cost with respect to the shape or the thickness of beams and shells. Continuity and differentiability of the cost with respect to the shape has been shown on examples taking into account limit points and simple bifurcation points.
A second order derivative is computed via automatic differentiation using a mixed forward/backward method.
References: [1] A. Ibrahimbegović. Stress resultant geometrically nonlinear shell theory with drilling rotations, part I. a consistent formulation. Computer Methods in applied mechanics and engineering, (1994).