

Structural Optimization using the Level Set Method

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Resumo/Abstract: In this talk we present the level set method and how it can be used to perform structural optimization. The goal is to minimize an objective functional which depends on the geometry of a structure, whose behaviour is governed by linearized elasticity. To compute the sensitivity of the functional with respect to perturbations of the geometry, we use the concept of shape derivative. We use a novel approach which consists in using a volume expression for the shape derivative instead of the usual boundary expression. We explain how the level set method can be adapted to use this volume expression. We show the advantages of this approach from a numerical point of view, we discuss in particular the fact that it is easier to implement than the usual approach in level set methods. We illustrate the efficiency of this approach with a compact code written for educational purposes.