

Optimisation topologique et minimisation de la souplesse en élasticité linéaire.

Cornel Murea (IRIMAS)

Abstract: Travail en collaboration avec D. Tiba. We investigate a fixed domain approach in shape optimization, using a regularization of the Heaviside function both in the cost functional and in the state system. We consider the compliance minimization problem in linear elasticity, a well known application in this area of research. The optimal design problem is approached by an optimal control problem defined in a prescribed domain including all the admissible unknown domains. This approximating optimization problem has good differentiability properties and a gradient algorithm can be applied. Moreover, the paper also includes several numerical experiments that demonstrate the descent of the obtained cost values and show the topological and the boundary variations of the computed domains. The proposed approximation technique is new and can be applied to state systems given by various boundary value problems.