ICM 1998, Berlin, Aug. 18–27

Abstracts of Plenary and Invited Lectures

Section:

17. Control Theory and Optimization

1991 MS Classification:

Zowe, Jochem, Institut für Angewandte Mathematik, Universität Erlangen, Germany

What is the Best Material? — The Answer of a Mathematician

The talk deals with a central question of structural optimization which is formulated as the problem of finding the stiffest structure which can be made when both the distribution of material as well as the material itself can be freely varied. Our emphasis is on a mathematical formulation which leads to numerical procedures for the problem, and we show that the problem after discretization can be rewritten as a mathematical programming problem of special form. We propose iterative optimization algorithms based on interior-point methods and on semidefinite programming and show a broad range of numerical examples that demonstrates the efficiency of our approach.