Prof. Dr. Wolfgang Achtziger
Prof. Dr. Peter Recht

GEMEINSAMES

K O L L O Q U I U M
"OPTIMIERUNG UND OPERATIONS RESEARCH"

DER WIRTSCHAFTS- UND SOZIALWISSENSCHAFTLICHEN FAKULTÄT UND DER FAKULTÄT MATHEMATIK

Im Rahmen des Kolloquiums spricht

Herr Prof. Dr. Mathias Stolpe,
Technical University of Denmark, Kgs. Lyngby (Kopenhagen)

zum Thema

Global Optimization of Discrete Topology Design Problems.

Der Vortrag findet statt am

Mittwoch, den 14. November 2007, um 16 Uhr c.t.

(Tee: 15.45 Uhr) im Raum 614, Mathematikgebäude, 6. Stock.

Zusammenfassung: A classical problem within the field of structural topology optimization is to find the stiffest structure subject to multiple loads and a bound on the volume (or weight) of the structure. We minimize a weighted average of the compliances, i.e. the inverse of the stiffness. The design variables describe the cross sectional areas of the bars in a truss or fiber directions in a structure made of laminated composites. This class of problems is well-studied for continuous variables. We consider here the situation that the variables are discrete.
Our goal is to compute guaranteed globally optimal structures. We present a method for the computation of a global optimizer of the underlying non-convex discrete problem. The method is a finitely convergent nonlinear branch and cut method tailored to solve large-scale instances of the original discrete problem. The branch and cut algorithm is based on solving a sequence of continuous relaxations, which are obtained by relaxing the discreteness requirements. The main effect of this approach lies in the fact that these relaxed problems can be equivalently reformulated as all-quadratic convex problems and thus can be efficiently solved to global optimality.

Interessierte Hörerinnen und Hörer sind herzlich willkommen !

Der Vortrag richtet sich auch an Studierende der Mathematik und der Wirtschafts-
mathematik mit Vorkenntnissen in Optimierung und/oder Operations Research.

gez. W. Achtziger, P. Recht

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