

EINLADUNG ZUM MATHEMATISCHEN KOLLOQUIUM

Es spricht

Herr Prof. Dr. Christoph Buchheim
(TU Dortmund)

zum Thema:

Combinatorial Optimization under Semilinear Elliptic PDE-constraints

Abstract:

We address binary programming problems where the constraints arise implicitly from semilinear elliptic PDEs and bounds on the states. A typical example is the heating of a metallic workpiece by a given finite set of heat sources which may be switched on or off, with the objective of using as few sources as possible in order to achieve a given minimum temperature everywhere in the workpiece. In the case of linear PDEs, many such problems can be rewritten as (finite-dimensional) linear or convex quadratic integer programs over the controls, and hence solved by state-of-the-art integer programming software. For the non-linear case, the standard solution approach is to directly discretize the entire problem, resulting however in huge non-convex mixed-integer optimization problems that can be solved to proven optimality only in very small dimensions. For PDEs with a convex nonlinear part, which appear in the application mentioned above, we show that the solution operator is pointwise concave and submodular. This allows to over- and underestimate it by linear expressions, leading to linear cutting planes that can be used within an outer approximation framework.

(joint work with Renke Kuhlmann and Christian Meyer)

Mittwoch, 17.10.2018, 17:00 Uhr, Raum C 113 im Curiebau
(Kaffee 16:30 Uhr im Raum C 325)

Alle Interessenten sind herzlich eingeladen.

Die Hochschullehrer des Institutes