

VORträge zum Operations Research

Kolloquium des Instituts für Operations Research

Zeit: Donnerstag, 29. September 2016, 17:30 Uhr

Ort: Raum 253, Gebäude 11.40

Es spricht: Fabian Rigterink, M. Sc., University of Newcastle

Zum Thema: **Pooling Problems: Advances in Theory and Applications**

Abstract: The pooling problem is a nonconvex nonlinear programming problem with important applications. The nonlinearities of the problem arise from bilinear constraints that capture the blending of raw materials. In this talk, we summarise our recent contributions to the problem, which fall into the following categories:

- Formulations: we propose new multi-commodity flow formulations based on output, input and output and (input, output)-commodities, and evaluate their performance computationally.
- Complexity: we show that the pooling problem with one pool and a bounded number of inputs can be solved in polynomial time.
- Bounding the gap between the McCormick relaxation and the convex hull: we show that the so-called McCormick relaxation can be arbitrarily worse than the convex hull.
- Convex hulls of bilinear functions: Padberg introduced new classes of inequalities that can significantly strengthen the McCormick relaxation.

We study classes of bilinear functions where some of the Padberg inequalities characterise the convex hull, and evaluate computationally which of the inequalities are strongest.

We conclude the talk by studying an application of particular interest to Novocastrians: optimising coal blending operations at the port of Newcastle – the world's largest coal export port.

This is joint work with my PhD supervisors, Thomas Kalinowski, Natasha Boland, and Martin Savelsbergh.

Die Vorträge zum Operations Research wenden sich an alle Interessierten!

Bei Rückfragen wenden Sie sich bitte an:

Prof. Dr. Oliver Stein, Institut für Operations Research.