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Fakultät für Mathematik

Oskar-Morgenstern-Platz 1

A-1090 Vienna

Austria

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ONE WORLD OPTIMIZATION SEMINAR

November 1st 2021 @ 15:30 CEST (Central European Summer Time)

PATRICK MEHLITZ

(Brandenburg University of Technology Cottbus-Senftenberg)

Optimization Problems with Geometric Constraints: Asymptotic Stationarity and an Augmented Lagrangian Methods

Abstract. In this talk, we address optimization problems equipped with constraints given as the preimage of a closed set under a smooth mapping between Euclidean spaces. These so-called *geometric* constraints are quite general and model, among other things, conic constraints, e.g. regarding the second-order or semidefinite cone, disjunctive constraints, e.g. complementarity or vanishing constraints, or rank constraints on matrices.

After the formal introduction and motivation of the problem class, we first review recently established asymptotic optimality conditions and constraint qualifications for optimization problems with geometric constraints which rest upon modern variational analysis. A detailed comparison of the new concept of regularity with already available constraint qualifications from the literature demonstrates its mildness. Afterwards, we comment on an implementable multiplier-penalty-method for the numerical solution of optimization problems with geometric constraints and exploit the aforementioned theory for the convergence analysis. Results of computational experiments addressing cardinality-constrained portfolio optimization problems and MAXCUT problems are presented.

To close the talk, we foreshadow some potential extensions of the theory to other areas of variational analysis and optimization theory.

This talk is based on joint ongoing work with Matüs Benko (JKU Linz, U. Vienna), Xiaoxi Jia (U. Würzburg), Christian Kanzow (U. Würzburg), Alexander Y. Kruger (Federation U.), and Gerd Wachsmuth (BTU Cottbus-Senftenberg).

The link of the zoom-room of the meeting and the corresponding password will be announced the day before the talk on the mailing list of the seminar, to which one can subscribe on <https://owos.univie.ac.at>.