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Fakultät für Mathematik
Oskar-Morgenstern-Platz 1
A-1090 Vienna
Austria

<https://owos.univie.ac.at>

ONE WORLD OPTIMIZATION SEMINAR

July 27th, 2020 @ 15:00 CEST (Central European Summer Time)

CORALIA CARIŞ

(University of Oxford)

Tensor methods for non-convex optimization problems

Abstract. We investigate the evaluation complexity of finding high-order critical points of non-convex smooth optimization problems when high order derivatives of the objective are available. Adaptive regularisation (and time permitting trust region) methods are presented that use high-degree Taylor local models in a simple framework. Their global rates of convergence to standard notions of first, second and third order critical points of the objective are presented, and observed to be natural generalisations of the optimal bounds known for cubic regularisation. However, going beyond third-order criticality is challenging, requiring new notions of (approximate) high-order optimality. A strong, stable notion of a high-order local minimizer is presented, along with associated regularisation and trust-region variants that can find such points in a quantifiable way from a complexity viewpoint. Extensions of these methods and results to composite optimization, as well as to special structure functions (such as those satisfying the PL inequality) may also be discussed, time permitting.

This work is joint with Nick Gould (Rutherford Appleton Laboratory, UK) and Philippe Toint (University of Namur, Belgium).

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>.