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ONE WORLD OPTIMIZATION SEMINAR

September 27th 2021 @ 15:30 CEST (Central European Summer Time)

TIM HOHEISEL

(McGill University Montréal)

From Perspective Maps to Epigraphical Projections

Abstract. The projection onto the epigraph or a level set of a closed proper convex function can be achieved by finding a root of a scalar equation that involves the proximal operator as a function of the proximal parameter. We develop the variational analysis of this scalar equation. The approach is based on a study of the variational-analytic properties of general convex optimization problems that are (partial) infimal projections of the the sum of the function in question and the perspective map of a convex kernel. When the kernel is the Euclidean norm squared, the solution map corresponds to the proximal map, and thus the variational properties derived for the general case apply to the proximal case. Properties of the value function and the corresponding solution map —including local Lipschitz continuity, directional differentiability, and semismoothness— are derived. An SC1 optimization framework for computing epigraphical and level-set projections is thus established. Numerical experiments on 1-norm projection illustrate the effectiveness of the approach as compared with specialized algorithms.

This talk is based on joint work with Michael Friedlander (UBC) and Ariel Goodwin (McGill).

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>.