

Talk announcement

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Sensitivity analysis of the solution mapping for a large class of optimization problems

In this talk, we focus on behavior of local solutions to finite-dimensional parameterized optimization problems in a very general setting. Lipschitzian stability of these solutions has been a crucial topic in optimization theory for decades and while it is understood fairly well - an abstract characterization has been available since the introduction of the particular perturbation scheme in 2000 by Levy, Poliquin, and Rockafellar - there are still many open questions. We propose a new interpretation of this characterization, which also enables us to derive a new sufficient condition for the Lipschitzian stability in case of the standard nonlinear programs. Moreover, thanks to the recent developments in variational analysis, we are able to compute the graphical derivative of the local solution mapping. We connect the graphical derivative with a solution of certain optimization subproblem defined via second subderivatives of the original objective function. Our ultimate goal, motivated by the desire to articulate solution dynamics via a one-sided differential equation, is to develop conditions ensuring that the solution mapping - single-valued and Lipschitz continuous, but nonsmooth - possesses one-sided directional derivatives. As this is an ongoing project, sometimes we provide only partial answers and we also propose some related open questions.