

Quasi Interior-Type Optimality Conditions in Set-Valued Duality

Anca Grad

03.04.2014

Abstract

We introduce a new approach to duality in set-valued optimization, by means of solutions defined with the help of the nonempty quasi interior of a convex cone, employing a set-type criterion. We define and characterize a qi-conjugate function associated with a set-valued function, and a qi-subdifferential, in analogy to the conjugate function and subdifferential from scalar optimization. Weak duality theorems and theorems containing optimality conditions are proved for general unconstrained set-valued optimization problems, in connection to a newly proposed dual problem. In the particular case when the perturbation function extends the Lagrange perturbation from the scalar case, we prove a strong duality theorem for constrained set-valued optimization problems. An application of our strong set-valued Lagrange duality theorem by means of qi-efficiency, stated in $l^2(\mathbb{R})$, ends the presentation.