Crouzeix / Martinez Legaz / Volle

Generalized Convexity, Generalized Monotonicity: Recent Results

Recent Results

A function is convex if its epigraph is convex. This geometrical structure has very strong implications in terms of continuity and differentiability. Separation theorems lead to optimality conditions and duality for convex problems. A function is quasiconvex if its lower level sets are convex. Here again, the geo metrical structure of the level sets implies some continuity and differentiability properties for quasiconvex functions. Optimality conditions and duality can be derived for optimization problems involving such functions as well. Over a period of about fifty years, quasiconvex and other generalized convex functions have been considered in a variety of fields including economies, man agement science, engineering, probability and applied sciences in accordance with the need of particular applications. During the last twenty-five years, an increase of research activities in this field has been witnessed. More recently generalized monotonicity of maps has been studied. It relates to generalized convexity off unctions as monotonicity relates to convexity. Generalized monotonicity plays a role in variational inequality problems, complementarity problems and more generally, in equilibrium prob lems.

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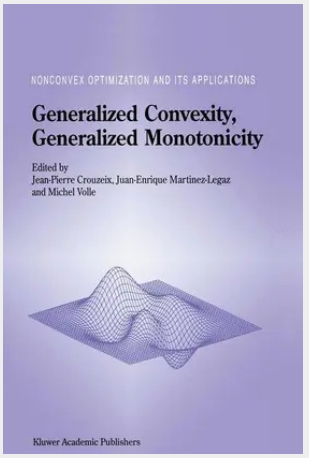

213,99 €
199,99 € (zzgl. MwSt.)

Nicht mehr lieferbar

Artikelnummer: 9780792350880
Medium: Buch
ISBN: 978-0-7923-5088-0
Verlag: Springer Us
Erscheinungstermin: 31.08.1998
Sprache(n): Englisch
Auflage: 1998. Auflage 1998
Serie: Nonconvex Optimization and Its Applications
Produktform: Gebunden
Gewicht: 1900 g
Seiten: 471
Format (B x H): 156 x 234 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)