Vector Optimization

Duality in Vector Optimization

Bearbeitet von
Radu Ioan Bot, Sorin-Mihai Grad, Gert Wanka

Weitere Fachgebiete > Mathematik > Numerik und Wissenschaftliches Rechnen > Angewandte Mathematik, Mathematische Modelle

schnell und portofrei erhältlich bei

Preface

The continuous and increasing interest concerning vector optimization perceptible in the research community, where contributions dealing with the theory of duality abound lately, constitutes the main motivation that led to writing this book. Decisive was also the research experience of the authors in this field, materialized in a number of works published within the last decade. The need for a book on duality in vector optimization comes from the fact that despite the large amount of papers in journals and proceedings volumes, no book mainly concentrated on this topic was available so far in the scientific landscape. There is a considerable presence of books, not all recent releases, on vector optimization in the literature. We mention here the ones due to Chen, Huang and Yang (cf. [49]), Ehrgott and Gandibleux (cf. [65]), Eichfelder (cf. [66]), Goh and Yang (cf. [77]), Göpfert and Nehse (cf. [80]), Göpfert, Riahi, Tammer and Zălinescu (cf. [81]), Jahn (cf. [104]), Kaliszewski (cf. [108]), Luc (cf. [125]), Miettinen (cf. [130]), Mishra, Wang and Lai (cf. [131, 132]) and Sawaragi, Nakayama and Tanino (cf. [163]), where vector duality is at most tangentially treated. We hope that from our efforts will benefit not only researchers interested in vector optimization, but also graduate and undergraduate students.

The framework we consider is taken as general as possible, namely we work in (locally convex) topological vector spaces, going to the usual finite dimensional setting when this brings additional insights or relevant connections to the existing literature. We tried to add a certain order in the not always correct or rigorous results one can meet in the different segments of the vast literature addressed here. The investigations we perform in the book are always accompanied by the well-developed apparatus of conjugate duality for scalar convex optimization problems. Actually, a whole chapter is dedicated to classical results, but also to new achievements in this field. An additional motivation for this, as well as for displaying a consistent preliminary chapter on convex analysis and vector optimization, was our intention to keep the book as self-contained as possible. Four chapters remained for the vector duality itself, two of them directly extending the conjugate duality from the scalar case,

another one focusing on the Wolfe and Mond-Weir duality concepts, while the last one deals with the broader class of set-valued optimization problems.

S.-M. Grad and G. Wanka are grateful to R. I. Boţ for the improvements he brought during the correction process. The authors want to express their sincere thanks to Ernö Robert Csetnek for reading a preliminary version of this book and for providing useful comments and suggestions that enhanced its quality. Thanks are also due to André Heinrich, Ioan Bogdan Hodrea and Catrin Schönyan for typewriting parts of the manuscript. We would like to thank our families for their unconditioned support and patience during writing this book. Without this background the authors would not have found the time and energy to bring this work to an end.

For updates and errata we refer the reader to

http://www.tu-chemnitz.de/mathematik/approximation/dvo

Chemnitz, Germany,   *Radu Ioan Boţ*
April 2009   *Sorin-Mihai Grad*
                                                            Gert Wanka

Springer